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## THESIS

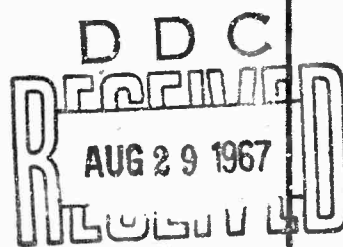
NUMERICAL FORECASTING OF  
CLEAR AIR TURBULENCE

by

Michael Joseph Ettel

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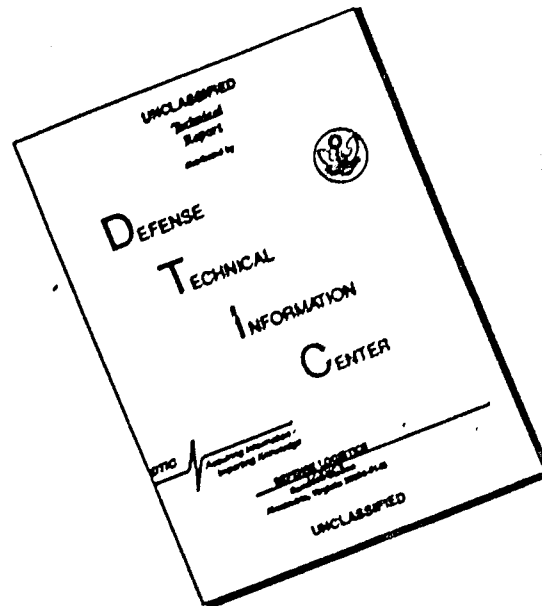
William Allen Morgan



June 1967

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NUMERICAL FORECASTING OF

CLEAR AIR TURBULENCE

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Submitted in partial fulfillment of the  
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# ABSTRACT

There is much disagreement as to (a) what causes clear air turbulence (turbulence which is not in or near convective clouds and is above 15,000 feet in altitude) and (b) which meteorological parameters can be used to detect and forecast its occurrence. The approach to this problem has been to relate not one parameter to clear air turbulence but various parameters. By summing these parameters areas can be defined where there is a high probability of encountering clear air turbulence. Each parameter has been based on a statistical study which found a relationship with clear air turbulence. The parameters used were horizontal and vertical shear, curvature, kinetic energy and their derivatives.

The numerical forecasting program proposed here can be extended to the stratosphere when more reliable height and temperature fields are available. This program will have much more significance when intermediate forecast height fields, temperature fields and a grid of much smaller mesh length are available.

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## 1. INTRODUCTION

The phenomenon of clear air turbulence (henceforth denoted as CAT) appears to consist of random three dimensional eddies that occur in certain confined regions of the atmosphere. This phenomenon was first recognized in the early 1940's as "air pockets", and has gained in importance and depth of study with the development of fast-flying swept wing and delta winged aircraft. It is of prime importance to the aviation industry because it affects the safety and comfort of passengers and crew, as well as operational costs. There have been several cases where loss of control of aircraft, structural damage, passenger and crew injuries (even deaths) have resulted from CAT.

Aircraft manufacturers and the airlines are interested in CAT in order to determine the strength of airframe design so that it can be built to withstand all degrees of turbulence. Planning of supersonic transport aircraft is considering the effects of this unexpected turbulence occurring at any flight level in the atmosphere. Therefore, it becomes an even greater operational problem in the era of future design of SST aircraft as to cost, safety and comfort. CAT is usually less intense than turbulence encountered in thunderstorms 1 . CAT may be considered at times more dangerous than "thunderstorm turbulence" as it usually occurs with no visible warning.

The various military agencies are deeply concerned with the understanding of CAT and its prediction so they may be better prepared to take it into account operationally in all areas of the world. Scientists are highly interested in CAT because it is a phenomenon of our environment that is not clearly understood. We are faced with the problem of having to rely on mesoscale data while the phenomenon is of a microscale. Because of the great differences in scales involved in the forecasting

problem, isolated patches of CAT (in either space or time) are very difficult to identify. It is the intent of this paper to develop a numerical forecasting system of CAT whereby an empirical approach has been used to accomplish this end.

## 2. DATA COLLECTION

The nature of clear air turbulence, its physics and its meteorology, are still not completely understood. More mesoscale (2km to 100km horizontal distance) and microscale (less than 2km) studies must be made concerning the causes and generation of CAT. Any improvement in forecasting skill that may be realized by this study will probably result from increased mesoscale input data into the forecast problem. The only mesoscale measurements available operationally at this time which concern the problem are rawinsonde data that give a nearly continuous measurement in the vertical of wind, pressure, temperature and humidity from the surface to above 30km in altitude, and satellite cloud pictures that delineate cloud structures down to a scale of about .5km.

The usual definition of CAT is "atmospheric turbulence which is not in or near convective clouds, including thunderstorms, and is not below 15,000 feet in altitude". (4) Thus, mechanical turbulence induced by rough terrain is excluded. It is realized that this is an extremely arbitrary definition resulting from a desire to simplify pilot reporting procedures.

Turbulence intensities are, at present, designated as light, moderate, severe and extreme. In recent years several definitions of the four categories of turbulence have been proposed. The current definitions in official use were developed by the National Advisory Committee for Aeronautics (NACA) Subcommittee on Meteorological Problems (1957). See Table 1.

There are few quantitative measurements of atmospheric turbulence at any scale. The bulk of the aircraft turbulence data available is based upon the four categories stated in Table 1, (4) , and, consequently is highly subjective and qualitative in nature. Included in the factors that affect the subjective decision of the pilot when reporting turbulence are the wing loading, the aircraft's speed and attitude, the pilot's training, experience, and his psychological reactions (1) .

Objective criteria for turbulence reporting must wait until more measurements are made of the conditions existing in the turbulent eddies, and until cockpit instrumentation includes a gust load or turbulence indicator.

Much time, effort and financial support have been expended in this country by the government, the aircraft industry, and private and public research facilities to investigate the problem of clear air turbulence and to find a good approach leading to a solution to this problem. This research has gone forward in three broad categories: first, research concerning the correlation of CAT with macroscale, mesoscale, and/or microscale atmospheric measurements; second, research into instrumentation for the detection of CAT sufficiently far in advance of the aircraft to allow evasive measures (6) and third, research by military and airline organizations concerning the operational aspects of CAT.

Various projects such as HICAT, ALLCAT, and TOPCAT have been undertaken to study clear air turbulence. The problems encountered were many but the results showed that it was indeed possible, with suitable instrumentation, to find, track and record CAT. The use of constant level balloons and doppler radar to detect CAT has met with some success, but again the lack of detail necessary in CAT studies leaves much to be desired.

Measurements of the microstructure, which contains the perturbations of CAT dimensions (100 to 500 meter wavelength), have been taken by specially instrumented aircraft. Until recently the aircraft itself was used as a sensor to measure atmospheric gusts from the aircraft acceleration data. The Air Force realized the danger of relying solely on the acceleration response of the U-2 aircraft as a measure of turbulence at high altitudes. A full knowledge of the aircraft's response to turbulence over a wide range of wavelengths is required for meaningful interpretation of such data. This procedure usually gives reliable results at short wavelengths up to a few hundred meters. At long wavelengths, this instrumentation becomes less sensitive. Accelerations in longer waves are usually small and can be masked by pilot induced aircraft motions.

A supersonic or hypersonic craft of some radical shape, flying four to ten times the speed of the U-2, will obviously have a somewhat different response to turbulence than the U-2. An aircraft flying at these high speeds would be affected much more by longer turbulence wavelengths and less by the shorter.

As pointed out earlier, the meteorologist has few direct measurements of turbulence intensities and must depend upon the accuracy of the intensities reported by pilots. In our study, we used the Colson monthly turbulence summaries which were obtained from the Air Force 3rd Weather Wing at Offutt AFB, Omaha, Neb. This report suited our needs most closely because the CAT reports were detailed as to location, time, altitude and intensity. In the period used in our study, December 1964 through March 1965, there were no less than 3670 CAT reports. The



reports were located over the United States and extended from about 15,000 feet to over 45,000 feet. The data were collected from military, civilian and private aircraft. They are, as mentioned before, quite subjective.

In the course of this paper three time periods or intervals will be used. It is important to establish at this point which periods were used and for what purpose.

A four month period (December 1964 through March 1965) is used for the research program during which several fields were constructed. Patterns of fields of different meteorological parameters were sometimes similar. Three out of four of them were dropped in our further investigation. In this way only three of the original seven parameters were retained.

The three day period (10 - 12 March, 1965) was used for a verification or correlation study. During this period of time a comparison was made to find out how many times C&T actually occurred in areas where it was predicted.

Finally, 11 February 1965 was arbitrarily chosen from the four month period and used only for illustrating the various fields and parameters used in the research program.

### 3. THE CLEAR AIR TURBULENCE STUDY

Clear air turbulence (CAT) is a microscale phenomenon (less than 2 kilometers in horizontal extent) but the conditions which are symptomatic of its existence are of synoptic scale. Therefore, synoptic scale parameters may be used to determine areas where CAT could occur, that is forecasting areas where there is a high probability of CAT.

From various reports and their contradictions it appears that no single parameter can detect CAT. Certain parameters can detect the possibility of CAT in some synoptic situations but fail in others.

The approach used in this paper was to take statistical studies made by previous investigators and to use the basic parameters which they related to CAT (2,3,5,7,8). If the magnitude of any one parameter becomes large or the sum of various parameters becomes large then there is a high probability of CAT in that area. Therefore, the problem is not one of forecasting actual CAT but rather to forecast areas of high and low probability of encountering CAT. In this way flights may be planned so as to expect least CAT.

The research program consisted of computing the equations shown in Appendix A. These equations were computed using the CDC 1604 digital computer. The program was written utilizing symbolic coded relocatable assembly program (SCRAP). It was necessary to use fixed point fractional numbers in order that Fleet Numerical Weather Facility (FNWF) subroutines could be used. All finite differences were computed using standard FNWF mesh length of 381 kilometers true at 60 degrees north latitude. There are no time derivatives in the program. The research reported here is accomplished using analytical fields. Operational use would employ

forecast fields. Results would naturally not have been as good if forecast fields were used in this research. "Prog 24 hours" printed at the bottom of each field represents the practical forecast interval to be used operationally.

The research program was written to compute CAT in three layers 500 to 300, 300 to 200, and 200 to 100 millibars. Computations were not made for the third layer since 100 millibar fields were not available.

The research program was written to compute on the entire 63 x 63 FNWF grid of the northern hemisphere. A boundary condition of zero was used for the outside rows and columns. The print routines are 22 x 22 extracts of the United States starting at FNWF grid point J008, I018. The latitude and longitude coordinates of the four corners of the printed fields starting with the lower left corner proceeding clockwise are: 9.1N 109.5W, 44.5N 165.5W, 57.7N 3.1E, 13.0N 58.8W.

All printed fields are pure numbers and have no dimensional meaning. All scaled outputs have been shifted to the left end of the register and the first three numbers with sign bit are printed out in decimal. Grid points can take on values from -999 to +999 except those fields which have been made all positive. The decimal point does not appear on the printed fields. Therefore, the printed grid point values are from -999 to +999.

In the research program the capital letters refer to the parameter as computed from the data. The small case letters serving as exponents represent the number of times and direction the register has to be shifted in order to place the significant portion into the first three numbers. Therefore, the two with exponents represent the scaling coefficient. Since the computations were in fixed point fractional all

printouts had to be shifted so as not to exceed one at any grid point in the field. Exceeding one would result in a meaningless value at that particular grid point. In addition the entire field had to be kept large enough so that patterns could exist and not be at or near zero throughout the field. Since these fields are summed they must be small enough so as not to cause the summation field to exceed one at any grid point.

The research program was run for thirty-six days during December 1964 and January, February, and March 1965. The thirty-six days were chosen because they were the most active in CAT reports during the four month period. In other words, there were more reports by pilots encountering CAT on these particular days. In order to show an example of each field printed out by the research program the time 00Z 23 FEB 65 was arbitrarily selected. These fields appear in Appendix C. Each field was produced by an individual term which will be described as follows:

#### THE FIRST TERM OF THE RESEARCH PROGRAM (APPENDIX A)

The First Term is  $\nabla^2 A$  where  $A$  is the Laplacian of absolute vorticity. When this term is negative there is a local maximum of absolute vorticity meaning it is larger at that grid point than the average of the surrounding grid points. Therefore, the cyclonic curvature or cyclonic shear or both are relatively large at that grid point. This should correspond to the cold side of the jet especially in troughs. According to English and McLean (1) there is a greater percentage of CAT on the cold side of the jet. Also according to Harrison (2) there is a strong tendency for moderate to severe CAT to be associated with trough lines.

This term was computed for the layer by first calculating the absolute vorticity of the upper and lower level D fields. The Laplacian was then taken of each field and a vertical average made of the upper and lower levels to obtain the Laplacian of vorticity of the layer.

This parameter has depicted most of the CAT associated with the trough over the western United States. The severe CAT near New Orleans is in an area of very large negative numbers. The field is contoured at intervals of 100 with the origin at zero.

#### THE SECOND TERM

The Second Term is  $2^b B$  where B is the absolute value of the vertical change in the vector thermal wind. One of the parameters which Lake's (7) statistical testing indicated was associated with CAT was the vertical gradient of wind shear. As shown by Richardson (9) the thermal wind shear is proportional to the gradient of static stability.

The u and v components of the thermal wind were computed from the upper and lower level temperature fields. The difference between the upper and lower level values of the u component was found and each difference was squared. This was also done for the v component. The square root of the sum of the squared differences gives the magnitude of the vector difference. According to Endlich and McLean (3) the largest values of the thermal wind shear appear on the warm side of the jet. This was found to be true throughout the four months. The contour interval for this field is 25 and the origin is zero.

#### THE THIRD TERM

The Third Term is  $2^c C$  where C is one half the geostrophic wind velocity squared. C therefore represents the specific kinetic energy or in other words the kinetic energy per unit mass

Clem (2) found that most cases of moderate to severe CAT were associated with areas of isotach maxima.

This term was computed for the layer by calculating the u and v components of the geostrophic wind at the upper and lower levels. The upper and lower level u components were vertically averaged to obtain an average u component for the layer. The average v component for the layer was obtained by a similar process. The magnitude of the velocity squared is just the sum of the squared components.

In the research program this field is contoured at intervals of 100 with the origin at zero. Contoured at this interval the kinetic energy field clearly depicts the isotach maxima regions. The kinetic energy field in Appendix C shows this field depicting the CAT in the western part of the United States occurring in areas of relatively large wind speeds. The kinetic energy field fails to indicate the severe CAT near New Orleans because it occurs in an area of relatively light winds.

#### THE FOURTH TERM

The Fourth Term is  $2^d D$  where D is the absolute value of the derivative of the kinetic energy with respect to pressure.

Lake's (7) statistical testing indicated that the gust intensities are related to the vertical gradients of horizontal kinetic energy. This term was computed for the layer by first calculating the velocity squared at the upper and lower levels. The vertical gradient for the layer was then obtained by computing the difference between the upper and lower level values of the velocity squared. The absolute value was taken so as to have all values positive. CAT should be associated with

large values of this field. Large values of this field were found only in areas of large values of kinetic energy. This field was therefore redundant and was eliminated from the CAT forecast program. The contour interval was 100 with the origin at zero.

#### THE FIFTH TERM

The Fifth Term is  $2^E E$  where  $E$  is the absolute value of the Laplacian of kinetic energy. The statistical survey made by Endlich and McLean (3) shows the maximum occurrence of CAT along the edges of the isotach maxima. The Laplacian of kinetic energy shows large horizontal changes in kinetic energy, both positive and negative. Therefore the absolute value of the term is taken in order to give only positive numbers. The contour interval was 25 with the origin at zero.

This term was introduced to depict the areas of large horizontal change in kinetic energy. However, there was no relationship with reported CAT. This field was therefore eliminated from the CAT forecast program.

#### THE SIXTH TERM

At this point in the research program it was necessary to sum the first five terms due to computer memory space. This term, referred to as KAT1, was the Sixth Term. The contour interval was 250 with the origin at zero. It was found that this term did not supply significantly new information since it was dominated by the kinetic energy and the two associated terms.

#### THE SEVENTH TERM

The Seventh Term is  $2^F F$  where  $F$  is the Jacobian of temperature and omega (component of the wind normal to the pressure surface). This

term was developed by Dr. Moore of Douglas Aircraft and Dr. Krishnamurti (3). The latter was associated at that time with the University of California, Los Angeles and consultant to Douglas Aircraft. The term was developed as the Jacobian of temperature and three dimensional divergence. As shown in their paper this is proportional to the negative of the Jacobian of temperature and omega. This term was computed for the lower level of each layer in the research program. The contour interval for this term was 100 with the origin at zero. In this program no significant relationship was found with large negative or positive numbers over the four month period. This term was therefore eliminated from the CAT forecast program.

#### THE EIGHTH TERM

The Eighth Term is  $2^8 G$  where  $G$  is the absolute value of horizontal divergence. It was computed by taking the derivative of omega with respect to pressure. As previously stated the entrance and exit regions of isotach maxima areas have been found to be associated with CAT. These areas are also associated with horizontal convergence at the entrance and divergence at the exit regions. Therefore the absolute value of the change in omega with pressure represents the convergence and divergence in the layer parallel to the pressure surfaces.

This term was computed by subtracting the lower level omega value from the upper level omega value at each grid point. Areas of convergence and divergence of the height field are quite vividly depicted by the divergence field. No significant relationship was found between the divergence field and the CAT occurrences, therefore, it was eliminated from the CAT forecast program.



## THE NINTH TERM

The Ninth Term was KAT2, the summation of all previous terms. No significant relationship was found with CAT occurrences since several terms tended to cancel each other out.

The program then goes into the second layer from 300 to 200 millibars. All terms were computed and scaled the same, except the divergence term. It could not be computed because the 200 millibar omega field was not available.

The third layer from 200 to 100 millibars could not be run for these time periods since the 100 millibar fields were not available. There were very few CAT reports above 200 millibars, therefore, the loss was insignificant.

In all three layers the lower level height field is printed out first. This gives a general impression of the synoptic situation and renders more significance to the patterns developed in the other fields. The contour interval for the 500 millibar field is 60 meters with the origin at 5580 meters. The contour interval for the 300 millibar field is 120 meters with the origin at 9120 meters. The contour interval for the 200 millibar field is 120 meters with the origin at 11,760 meters.

The CAT forecast program appears in Appendix D. The first three terms of the research program are used with minor changes. In the first term "a" is changed to minus one and the contour interval has been changed to 150 to give better defined patterns. The second term has been used unchanged. The third term is unchanged except for the contour interval which was changed to 50 to increase the pattern size. The KAT field itself is the summation of these three terms and gives quite reasonable patterns and pattern sizes.

The pattern area depicting a high probability of CAT would necessarily be larger during a more active CAT period. The most active part of the year was the four month period December 1964, January, February, and March 1965. During these months the most active three day period was the tenth through the twelfth of March 1965. Therefore the KAT fields have quite large pattern sizes in Appendix E since they represent the most active three days of the year. The KAT field patterns were smaller for less active periods. The total area covered by these patterns is much less in the KAT field than in the other three parameter fields.

This is exactly what was attempted in order to obtain optimum size of the forecasted danger areas. If the KAT field patterns are too large, flights will be rerouted unnecessarily. On the other hand, if the KAT field patterns are too small, there is a real danger of CAT occurring outside these areas. Therefore, the restraint of the KAT field patterns is necessary in order to have an operationally useable product.

#### 4. DISCUSSION AND RECOMMENDATION FOR FUTURE STUDIES

The period used in this paper was chosen because of the largest number of reported CAT occurrences. Of the four month period (December 1964, January, February and March 1965) there were scattered periods where a large number of occurrences were reported. This four-month period was used to determine which parameters were best suited for forecasting purposes. The three-day period of 10-12 March 1965 was selected for a correlation study in order to find out how successful our forecast method is. Tables 2, 3, and 4 show the various fields used and the resultant KAT field for the 10th, 11th and 12th of March 1965.

The use of the term "percent correlation" as used in this study does not mean to imply a statistical correlation. The ideal forecast verification makes use of those cases where CAT is forecast, but does not occur, and where CAT is not forecast and does not occur. In our study it was impossible to take those cases quantitatively into account. Therefore, it is to be understood that "correlation" as used in this study was a general comparison of those reported CAT occurrences that fell within the delineated area of high probability of CAT against those that did not. For example, if there were ten reported CAT occurrences for a given layer and time period and six of these reports fell inside or on the line delineating the CAT area and four reports fell outside the area, then for that field, layer and time period we would list it as six occurrences correlated or a sixty percent correlation.

Listed are the names of the fields, the number of occurrences of CAT for each field and the percent correlation by field. Also shown are the number of occurrences and the number of occurrences that correlated by field and CAT intensity.

After combining the Laplacian of Vorticity, Vertical Gradient of Thermal Wind and Kinetic Energy we arrive at the KAT Field which is our end product for the area of high probability of CAT occurrences. Even though a higher correlation may be seen in some fields other than the KAT field, one should realize that these fields encompassed a larger than average area. In such cases one must expect a high correlation.

The high correlation is then not due to the finesse of the forecast method, but rather due to the fact that for most of the USA there was a forecast of high probability for CAT. Theoretically, it would be a good idea to divide the percent correlation (such as we computed) by the size of the area for which CAT was forecasted. We did not follow this idea quantitatively, but only qualitatively. Therefore, one finds that the percent correlation for our ultimate forecast (labeled EAT) is sometimes lower than the percent correlation for one of the three separate forecasting fields.

Table 5 is a summary for the three day period. It shows the total number of CAT occurrences by turbulence category, percent correlation by field and turbulence category, and the three day percent correlation by field.

The results were most encouraging and we feel that our end product was a substantial step in at least the right direction toward forecasting clear air turbulence. Our knowledge of the meso- and micro- structure of flow patterns in the free atmosphere, especially above the tropopause, is still rather poor. A strong need still exists for a well organized and well equipped measurement program, especially at flight levels of the future supersonic transport aircraft. Measurement programs using

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6. APPENDIX A  
EQUATIONS

The numbers in parentheses on this and the following pages refer to the page numbers in the text where each item is discussed.

The numbers below each term in the following two equations identify the number of each term (e.g., RAT1 is the sixth term).

#### THE RESEARCH PROGRAM (p. 15)

$$\text{RAT1} = \overset{6}{r^2} \overset{1}{A} - \overset{2}{r^2} \overset{2}{B} - \overset{3}{r^2} \overset{3}{C} - \overset{4}{r^2} \overset{4}{D} - \overset{5}{r^2} \overset{5}{E}$$

$$\text{RAT2} = \text{RAT1} - \overset{6}{r^2} \overset{6}{F} - \overset{8}{r^2} \overset{8}{G}$$

#### THE FIRST TERM $r^2 A$ (p. 15)

$$a = 0 \quad A = r^2 \tau$$

$$\tau_0 = 1 + \frac{1}{r^2} (\tau_1 + \tau_2 + \tau_3 + \tau_4 - 4\tau_0)$$

$$r^2 \tau_0 = \frac{1}{r^2} (\tau_1 + \tau_2 + \tau_3 + \tau_4 - 4\tau_0)$$

$$r^2 \tau = 1/2 (r^2 \tau_u + r^2 \tau_v)$$

#### THE SECOND TERM $r^2 B$ (p. 16)

$$b = 0 \quad B = \frac{1}{2} \left( \frac{\tau^2}{r^2} \right)$$

$$u_c = \frac{1}{r^2} \frac{(\tau_2 - \tau_4)}{2d}$$

$$v_c = \frac{1}{r^2} \frac{(\tau_3 - \tau_1)}{2d}$$

$$\tau_{c_u} = u_c \cdot 1 + v_c \cdot j$$

$$\tau_{c_L} = u_{c_L} \cdot 1 + v_{c_L} \cdot j$$

$$\frac{\Delta \tau_c}{\Delta P} = \frac{\tau_{c_L} - \tau_{c_u}}{\Delta P} = \frac{[u_{c_L} \cdot 1 + v_{c_L} \cdot j]}{\Delta P} - \frac{[u_{c_u} \cdot 1 + v_{c_u} \cdot j]}{\Delta P}$$



$$\frac{\Delta \vec{V}_t}{\Delta P} = \frac{[U_{tL} - U_{tu}]}{\Delta P} i + \frac{[V_{tL} - V_{tu}]}{\Delta P} j = \frac{\Delta U_t}{\Delta P} i + \frac{\Delta V_t}{\Delta P} j$$

$$\left| \frac{\Delta \vec{V}_t}{\Delta P} \right|^2 = \left( \frac{\Delta U_t}{\Delta P} \right)^2 + \left( \frac{\Delta V_t}{\Delta P} \right)^2$$

THE THIRD TERM  $2^c$  (p. 16)

$$c = 0 \quad C = \frac{\bar{\vec{V}}^2}{2}$$

$$U_g = \frac{-g}{f} \frac{[Z_2 - Z_4]}{2d}$$

$$V_g = \frac{g}{f} \frac{[Z_3 - Z_1]}{2d}$$

$$\bar{U}_g = \frac{U_{gu} + U_{gL}}{2}$$

$$\bar{V}_g = \frac{V_{gu} + V_{gL}}{2}$$

$$\bar{\vec{V}}_g = \bar{U}_g i + \bar{V}_g j$$

$$\bar{\vec{V}}_g^2 = (\bar{U}_g)^2 + (\bar{V}_g)^2$$

THE FOURTH TERM  $2^d$  (p. 17)

$$d = 1 \quad L = \left| \frac{\bar{\vec{V}}^2}{2 \Delta P} \right|$$

$$\frac{\bar{\vec{V}}^2}{\Delta P} = \frac{\bar{\vec{V}}_L^2 - \bar{\vec{V}}_u^2}{\Delta P}$$

$$\left| \frac{\bar{\vec{V}}^2}{\Delta P} \right| = \sqrt{\left( \frac{\bar{\vec{V}}^2}{\Delta P} \right)^2}$$

THE FIFTH TERM  $2^e E$  (p. 18)

$$e = 1 \quad E = \left| \nabla^2 \frac{\bar{\nabla}^2}{2} \right|$$

$$\nabla^2 \bar{\nabla}_0^2 = \frac{1}{d^2} [\bar{\nabla}_1^2 + \bar{\nabla}_2^2 + \bar{\nabla}_3^2 + \bar{\nabla}_4^2 - 4\bar{\nabla}_0^2] \quad |\nabla^2 \bar{\nabla}_0^2| = \sqrt{(\nabla^2 \bar{\nabla}_0^2)^2}$$

THE SIXTH TERM (p. 18)

$$KAT1 = \nabla^2 \eta - \left| \frac{\Delta \bar{\nabla}}{\Delta P} \right| - \frac{\bar{\nabla}^2}{2} - \left| \frac{\Delta \bar{\nabla}^2}{\Delta P} \right| - \left| \nabla^2 \frac{\bar{\nabla}^2}{2} \right|$$

THE SEVENTH TERM  $2^f F$  (p. 18)

$$f = 11 \quad F = J[T, \omega]$$

$$J[T, \nabla_3 \cdot \bar{\nabla}] = \frac{-1}{\gamma_F} J[T, \omega]$$

$$J[T, \omega] = \frac{1}{4d^2} [(T_3 - T_1)(\omega_2 - \omega_4) - (T_2 - T_4)(\omega_3 - \omega_1)]$$

THE EIGHTH TERM  $2^g G$  (p. 19)

$$g = 13 \quad G = \left| \frac{\Delta \omega}{\Delta P} \right|$$

$$\frac{\Delta \omega}{\Delta P} = \frac{1}{\Delta P} [\omega_L - \omega_u] \quad \left| \frac{\Delta \omega}{\Delta P} \right| = \frac{1}{\Delta P} \sqrt{(\omega_L - \omega_u)^2}$$

THE NINTH TERM (p. 20)

$$KAT2 = KAT1 + 2^{11} J[T, \omega] - 2^{13} \left| \frac{\Delta \omega}{\Delta P} \right|$$

PROG KAT PROGRAM (p. 20)

$$KAT = 2^{-1} v^2 \eta - \left| \frac{\Delta \vec{v} T}{\Delta P} \right| - \frac{\vec{v}^2}{2}$$

7. APPENDIX B

THE RESEARCH COMPUTER PROGRAM

IDENT	ETIFL	MURGAN
00000	RTJ	START
00001	RTJ	WPA002
00002	RTJ	UNPCKD2
00003	RTJ	READT2
00004	RTJ	UNPCKT2
00005	RTJ	WLAD01
00006	RTJ	UNPCKD1
00007	RTJ	READT1
00010	RTJ	UNPCKT1
00011	RTJ	REWIND
00012	RTJ	REWIND1
00013	RTJ	PRINT
00014	RTJ	SINF
00015	RTJ	VURTIS1
00016	RTJ	VURTIS2
00017	RTJ	LAPLAC1

PUT DATE TIME IN A REGISTER  
 HEADS PACKED LOWER LEVEL 0 FIELD INTO FS4  
 UNPACKS LOWER LEVEL 0 FIELD INTO FS1  
 HEADS LOWER LEVEL TEMPERATURE FIELD INTO FS4  
 UNPACKS LOWER LEVEL TEMPERATURE FIELD INTO FS1  
 HEADS PACKED UPPER LEVEL 0 FIELD INTO FS4  
 UNPACKS UPPER LEVEL 0 FIELD INTO FS0  
 HEADS UPPER LEVEL TEMPERATURE FIELD INTO FS4  
 UNPACKS UPPER LEVEL TEMPERATURE FIELD INTO FS2  
 REMINDS TO 3 CH 5/6  
 PRINTS LOWER HEIGHT FIELD  
 GENERATES SINE FIELD STOMS IN FS4  
 COMPUTES VORTICITY FIELD FROM UPPER LEVEL 0 FIELD STOMS IN FS5  
 COMPUTES VORTICITY FIELD FROM LOWER LEVEL 0 FIELD STOMS IN FS6  
 COMPUTES LAPLACIAN OF UPPER LEVEL VORTICITY FIELD STOMS IN FS0

MORGAN

00620	75 4 0114	+	RTJ	LAPLAC2	COMPUTES LAPLACIAN OF LOWER LEVEL VORTICITY FIELD STOMS IN PSI
00621	50 0 00000	+	RTJ	MINI2	COMPUTES AVERAGE VORTICITY BETWEEN UPPER AND LOWER LEVELS STOMS IN FSS
00622	75 4 01022	+	RTJ	PRINT1	STOMS SCALED MAP FACTOR IN FSS
00623	50 0 00000	+	RTJ	PHAT	COMPUTES U COMPONENT OF THERMAL WIND AT LOWER LEVEL STOMS IN FSS
00624	75 4 01027	+	RTJ	UTM1	COMPUTES V COMPONENT OF THERMAL WIND AT LOWER LEVEL STOMS IN FSS
00625	50 0 00000	+	RTJ	UTM2	COMPUTES U COMPONENT DIFFERENCE BETWEEN UPPER AND LOWER LEVELS STOMS IN FSS
00626	75 4 01071	+	RTJ	OUTHM	COMPUTES V COMPONENT OF THERMAL WIND AT LOWER LEVEL STOMS IN FSS
00627	50 0 00000	+	RTJ	VTHM1	COMPUTES V COMPONENT OF THERMAL WIND AT UPPER LEVEL STOMS IN FSS
00630	75 4 01114	+	RTJ	VTHM2	COMPUTES V COMPONENT DIFFERENCE BETWEEN UPPER AND LOWER LEVELS STOMS IN FSS
00631	50 0 00000	+	RTJ	OUTHM	COMPUTES VERTICAL GRADIENT OF THERMAL WIND STOMS IN FSS
00632	75 4 01137	+	RTJ	OUTHM	SEE ABOVE
00633	50 0 00000	+	RTJ	PPINT2	SEE ABOVE
00634	75 4 01147	+	RTJ	KAT1	SEE ABOVE
00635	50 0 00000	+	RTJ	RLADD2	SEE ABOVE
00636	75 4 00720	+	RTJ	UNPKRD2	SEE ABOVE
00637	50 0 00000	+	RTJ	READD1	SEE ABOVE
00640	75 4 00713	+	RTJ	UNPKRD1	REINDS .J 3 CH 5/6
00641	50 0 00000	+	RTJ	REIND	
00642	75 4 00765	+	RTJ	REIND1	

MURRAY

00643	75 4 00771 50 0 00000	+	RTJ	SINF	SEE ABOVE
00644	75 4 01127 50 0 00000	+	RTJ	MMAT	SEE ABOVE
00645	75 4 01154 50 0 00000	+	RTJ	UGE0S1	COMPUTES U COMPONENT OF GEOSTROPHIC WIND AT UPPER LEVEL STOMS IN FS2
00646	75 4 01172 50 0 00000	+	RTJ	UGE0S2	COMPUTES U COMPONENT OF GEOSTROPHIC WIND AT LOWER LEVEL STOMS IN FS3
00647	75 4 01210 50 0 00000	+	RTJ	UGE0S	COMPUTES AVERAGE U COMPONENT STOMS IN FS2
00650	75 4 01217 50 0 00000	+	RTJ	UGE0S1	COMPUTES V COMPONENT OF GEOSTROPHIC WIND AT UPPER LEVEL STOMS IN FS3
00651	75 4 01235 50 0 00000	+	RTJ	UGE0S2	COMPUTES V COMPONENT OF GEOSTROPHIC WIND AT LOWER LEVEL STOMS IN FS3
00652	75 4 01253 50 0 00000	+	RTJ	UGE0S	COMPUTES AVERAGE V COMPONENT STOMS IN FS0
00653	75 4 01262 50 0 00000	+	RTJ	KINETIC	COMPUTES V SQUARE STOMS IN FS4
00654	75 4 01567 50 0 00000	+	RTJ	PRINT4	
00655	75 4 01613 50 0 00000	+	RTJ	PRINTS	
00656	75 4 01274 50 0 00000	+	RTJ	LAPKIN	COMPUTES LAPLACIAN OF KINETIC ENERGY STOMS IN FS6
00657	75 4 01637 50 0 00000	+	RTJ	PRINT6	
00660	75 4 01306 50 0 00000	+	RTJ	KAT2	STOMS PREVIOUS TERMS IN FS0
00661	75 4 01663 50 0 00000	+	RTJ	PRINT7	
00662	75 4 03746 50 0 00000	+	RTJ	READT2	SEE ABOVE
00663	75 4 00734 50 0 00000	+	RTJ	UNPCKT2	SEE ABOVE
00664	75 4 00761 50 0 00000	+	RTJ	REWIND	REWINDS TU 3 CH 9/6
00665	75 4 01327 50 0 00000	+	RTJ	READ02	READS OMEGA FIELD INTO FS4
00666	75 4 01335 50 0 00000	+	RTJ	UNPCKD2	UNPACKS LOWER LVL OMEGA INTO FS6

MURGA

00667	75 4 00765 50 0 00000	RTJ	REWIND1	REWINDS TU2 CH 5/6
00670	75 4 01342 50 0 00000	RTJ	MURRE	COMPUTES THE JACOBIAN OF TEMPERATURE AND WIND STRESS IN PSI
00671	75 4 01314 50 0 00000	RTJ	RTJDD1	SPARS OMEGA FIELD INTO FS4
00672	75 4 01322 50 0 00000	RTJ	UNPACK01	UNPACKS UPPER LVL OMEGA INTO FS5
00673	75 4 00765 50 0 00000	RTJ	REWIND1	
00674	75 4 01355 50 0 00000	RTJ	HURDVG	COMPUTES HORIZONTAL DIVERGENCE STOMS FS5
00675	75 4 01365 50 0 00000	RTJ	ABSOLV	COMPUTES ABSOLUTE DIVERG STOMS IN FS5
00676	75 4 01707 50 0 00000	RTJ	PRINT8	
00677	75 4 01543 50 0 00000	RTJ	PRINT3	
00700	75 4 01373	RTJ	KAT	COMPUTES VORTICITY DIFFERENCE PLUS THERMAL WIND DIFFERENCE PLUS KINETIC ENERGY DIFFERENCE PLUS THE CHANGE IN KINETIC ENERGY PLUS KINETIC ENERGY PLUS THE DIVERGENCE
00701	50 0 00000	RTJ	PRINT7	
00702	75 4 01663 50 0 00000	RTJ	LAYER2	COMPUTES 300 TO 200 MB LAYER
00703	75 4 01400 50 0 00000	RTJ	LAYER3	COMPUTES 200 TO 100 MB LAYER
00704	75 4 01424 50 0 00000	SLS		END OF STEERING PROGRAM USES OFF LINE PRINTIN
00705	75 4 00000 50 0 00000	READD1	SLJ	
00706	12 0 02001 14 0 01735	LVA	TRAPF1	
00707	75 4 04231 50 0 00000	RTJ	MAU	
00710	50 0 02014 50 0 01300	SHI	MAA	
00711	50 0 04215 50 0 02007	PHI	13508	
00712	75 4 00765 50 0 00000	SLJ	FS4 READERR	
00713	75 4 00000 50 0 00000	UNPACK1	SLJ	



MURKIN

00714	75 0 00715	+	SLJ	FS4
00715	75 0 00715		CU	2451H
00716	75 0 00715	+	RTJ	WAB
00717	75 0 00715		SLJ	UNPCKD1
00720	75 0 00000	WABD1	SLJ	**
00721	12 0 02201	+	LOA	TIME
00722	75 0 00721	+	RTJ	WAB
00723	50 0 01300		CHI	WAB
00724	50 0 00721		CHI	1300H
00725	75 0 00720		CHI	WAB
00726	75 0 00000	UNPCKD2	SLJ	WAB
00727	75 0 00721	+	SLJ	UNPCKD2
00730	50 0 02453		CU	2453H
00731	75 0 00726	+	RTJ	WAB
00732	75 0 00726		SLJ	UNPCKD2
00733	75 0 00000	READT1	SLJ	**
00734	12 0 02201	+	LOA	TIME
00735	75 0 00731	+	RTJ	WAB
00736	50 0 01300	HIGHT	CHI	WAB
00737	50 0 00721		CHI	1300H
00740	75 0 00733		SLJ	WAB
00741	75 0 00000	UNPCKD1	SLJ	**
00742	75 0 00744	+	SLJ	WAB
00743	50 0 02453		CU	2453H

MARKA

00744	75 4 04715 50 0 00000	+	RTJ FNI	WAB 7
00745	75 4 00741 50 0 00000		SLJ	UNPKCT1
00746	75 4 00000 50 0 00000	READY	SLJ	**
00747	12 0 02001 16 0 01744	+	LDA LDG	TIME NAME4
00750	75 4 04231 50 0 00000	+	RTJ FNI	MAG 0.5
00751	50 0 02014 50 0 01300		FNI	MAA 1300R
00752	50 0 04215 50 0 02007		FNI	PS4 READER
00753	75 4 00746 50 0 00000		SLJ	READY2
00754	75 4 00000 50 0 00000	UNPKCT7	SLJ FNI	** 0.6
00755	75 4 00757 50 0 44215	+	SLJ AD	**2 PS4
00756	50 0 04255 50 0 02451		DO DO	PS3 24530
00757	75 4 04715 50 0 00007	+	RTJ FNI	WAB 7
00760	75 4 00754 50 0 00000		SLJ	UNPKCT2
00761	75 4 00000 50 0 00000	REWIND	SLJ	**
00762	75 4 02014 50 0 11306	+	RTJ DO	MAA 11306R
00763	75 4 00761 50 0 00000	+	SLJ	REWIND
00764	75 4 02013 50 0 00000	+	SLJ	WINDERR
00765	75 4 00000 50 0 00000	REWIND	SLJ	**
00766	75 4 02014 50 0 11226	+	RTJ DO	MAA 11206R
00767	75 4 00765 50 0 00000	+	SLJ	REWIND
00770	75 4 02013 50 0 00000	+	SLJ	WINDERR
00771	75 4 00000 50 0 00000	SINF	SLJ	**
00772	75 4 04235 50 0 44215	+	RTJ FNI	PS4
00773	75 4 00771 50 0 00000	+	SLJ	SINF

MURGAN

00774	75 0 00000 50 0 00000		VORTIS1	SLJ	**
00775	75 4 04611 50 0 44211	+		RTJ ENI	SAR FS4
00776	50 0 05015 50 0 54055			ENI	FS5
00777	50 0 02011 50 0 04451			ENI	VORTER1 SAH
01000	75 0 00774 50 0 00000			SLJ	VORTIS1
01001	75 0 00000 50 0 00000		VORTIS2	SLJ	**
01002	75 4 04611 50 0 44211	+		RTJ ENI	SAR FS4
01003	50 0 14655 50 0 63715			ENI	FS1 FS6
01004	50 0 02012 50 0 04451			ENI	VORTER2 SAH
01005	75 0 01001 50 0 00000			SLJ	VORTIS2
01006	75 0 00000 50 0 00000		LAPLAC1	SLJ	**
01007	75 4 04423 00 0 05015	+		RTJ 00	SAD FS0
01010	00 0 54055 00 0 02004			00	FS5 LAPERR1
01011	75 4 04451 50 0 04447	+		RTJ ENI	SAH SAD+248
01012	50 0 04435 50 0 04435			ENI	SAD+128
01013	75 0 01006 50 0 00000			SLJ	LAPLAC1
01014	75 0 00000 50 0 00000		LAPLAC2	SLJ	**
01015	75 4 04423 00 0 14655	+		RTJ 00	SAD FS1
01016	00 0 63715 00 0 02005			00	FS6 LAPERR2
01017	75 4 04451 50 0 04447	+		RTJ ENI	SAH SAD+248
01020	50 0 04435 50 0 04435			ENI	SAD+128
01021	75 0 01014 50 0 00000			SLJ	LAPLAC2
01022	75 0 00200 50 4 00000		MORIZ	SLJ	**
01023	12 4 05015 14 4 14655		LOOPI	LOA ADD	FS0+4 FS1+4

MURGAN

01024	20 4 54355 50 0 00000		STA	FS5.4
01025	54 4 01600 75 1 01023	+	ISK SLJ	76008.4 COUPL
01026	75 0 01022 50 0 00000		SLJ	MURIZ
01027	75 0 00000 50 0 00000	MHAT	SLJ	..
01030	75 4 04570 00 0 02002	+	RTJ OO	SAJ MATER
01031	50 0 44315 50 0 63715		ENI ENI	FS4 FS6
01032	75 4 04451 00 0 04577	+	RTJ OO	SAH SAJ+7A
01033	50 0 04577 50 0 04577		ENI ENI	SAJ+7H SAJ+7A
01034	75 0 01027 50 0 00000		SLJ	MHAT
01035	75 0 00000 50 0 00000	LTHM1	SLJ	..
01036	75 4 04451 00 0 01041	DIF1	RTJ OO	SAH OUTS101
01037	50 0 01043 50 0 01043	+	ENI ENI	INS101 INS101
01040	75 0 01035 50 0 00000	+	SLJ	UTHM1
01041	10 0 00000 20 2 05315	OUTS101	ENA STA	Q FS0.2
01042	75 0 01036 50 0 00000		SLJ	DIF1
01043	12 2 44215 01 0 00001	INST01	LDA ARS	FS4.2 1
01044	14 0 01733 20 0 01775		ADD SYA	CONST1 LOCAT1
01045	26 0 01775 20 0 01775		MUF SYA	LOCAT1 LOCAT1
01046	15 1 24515 15 1 24515		LDA	FS2.1
01047	20 0 01776 12 0 01734		STA LUA	LOCAT2 CONST2
01050	26 0 01775 26 0 01775		MUF LOCAT1	FS012 LOCAT2
01051	27 2 24515 27 2 24515		DVF DVF	LOCAT1 FS2.2
01052	20 0 01036 20 0 01036		STA SLJ	FS012 DIF1
01053	75 0 00000 50 0 00000	UTHM2	SLJ	..

MURGAN

01054	75 4 04451 20 0 01051	DIF2	RTJ 10	SAN OUTSID2
01055	50 0 01061 50 0 01061	+	FNI	INSID2
01056	75 0 01053 50 0 00000	+	SLJ	VTMM2
01057	10 0 00000 20 2 14655	OUTSID2	FMA STA	0 FS1.2
01060	75 0 01054 50 0 00000		SLJ	DIF2
01061	12 2 44215 01 0 00001	INSID2	LDA ARS	FS4.2 1
01062	14 0 01733 20 0 01773		ADD STA	CONST1 LOCAT1
01063	26 0 01773 26 0 01773		MUF STA	LOCAT1 LOCAT1
01064	12 3 34355 15 1 34355		LOA SUR	FS3.3 FS3.1
01065	20 0 01776 12 0 01734		STA LOA	LOCAT2 CONST2
01066	26 2 63715 26 0 01776		MUF MUF	FS6.2 LOCAT2
01067	27 0 01775 27 2 34355		OVF OVF	LOCAT1 FS3.2
01070	20 2 14655 75 0 01054		STA SLJ	FS1.2 01F2
01071	75 0 00000 50 4 00000	DUTHM	SLJ FNI	0.4 0.4
01072	13 4 05015 13 4 14655	LOOP4	LOA SUR	FS0.4 FS1.4
01073	20 4 05015 50 0 00000		STA	FS0.4
01074	54 4 07600 75 0 01072	+	ISK SLJ	76008.4 LOOP4
01075	75 0 01071 50 0 00000		SLJ	DUTHM
01076	75 0 00000 50 0 00000	VTMM1	SLJ	0.4
01077	75 4 04451 00 0 01102	DIF3	RTJ 00	SAN OUTSID3
01100	50 0 01104 50 0 01104	+	FNI	INSID3
01101	75 0 01076 50 0 00000	+	SLJ	VTMM1
01102	10 0 00000 20 2 14655	OUTSID3	FMA STA	0 FS1.2
01103	75 0 01077 50 0 00000		SLJ	01F3

MURRAY

01104	12 2 44215 01 0 00001	INSID4	LDA ARS	FS4.2 1
01105	14 0 01734 20 0 01775		ADD STA	CONS11 LOCAT1
01106	26 0 01775 20 0 01775		MUF STA	LOCAT1 LOCAT1
01107	12 2 24516 13 2 24514		LDA SUB	FS2-1.2 FS2-1.2
01110	20 0 01776 12 0 01734		STA LDA	LOCAT2 CONS12
01111	26 2 63715 28 2 01776		MUF MUF	FS2.2 LOCAT2
01112	27 0 01775 27 2 24515		DVF DVF	LOCAT1 FS2.2
01113	20 2 14555 29 0 01777		STA SLJ	FS1.2 DIF2
01114	75 0 00000 50 0 00000	VTM2	SLJ	..
01115	75 0 04451 00 0 01120	DIF4	RTJ CO	INSID4 OUTSID4
01116	20 0 01122 20 0 01122	+	ENI ENI	INSID4 INSID4
01117	75 0 01114 50 0 00000	+	SLJ	VTM2
01120	10 0 00000 20 2 24515	OUTSID4	FMA STA	0 FS2.2
01121	75 0 01115 50 0 00000		SLJ	DIF4
01122	12 2 44215 01 0 00001	INSID4	LDA ARS	FS4.2 1
01123	14 0 01733 20 0 01775		ADD STA	CONS11 LOCAT1
01124	26 0 01775 20 0 01775		MUF STA	LOCAT1 LOCAT1
01125	12 2 34356 13 2 34354		LDA SUB	FS3-1.2 FS3-1.2
01126	20 0 01776 20 0 01734		STA LDA	LOCAT2 CONS12
01127	26 2 63715 26 0 01776		MUF MUF	FS2.2 LOCAT2
01130	27 0 01775 27 2 34355		DVF DVF	LOCAT1 FS3.2
01131	20 2 24515 75 0 01115		STA SLJ	FS2.2 DIF2
01132	75 0 00000 50 0 00000	DVTM	SLJ ENI	.. 0.4
01133	12 4 24515 13 4 14654	LOMP7	LDA SUB	FS2.4 FS1.4

MURGAN

C1134	20 4 14555		STA	FS1.4
	20 0 00000			
C1135	54 4 07600	+	ISK	76000.4
	75 0 01133		SLJ	LOOP7
C1136	75 0 01132		SLJ	DVTHM
	50 0 00000			
C1137	75 0 00000	DTHM	SLJ	0.4
	50 4 00000		ENI	0.4
C1140	12 4 05015	LOOP8	LDA	FS0.4
	28 4 05015		PUF	FS0.4
C1141	20 4 05015		STA	FS0.4
	12 4 14635		LDA	FS1.4
C1142	26 4 14635		PUF	FS1.4
	14 4 14635		ADD	FS1.4
C1143	75 4 04646	+	RTJ	VAB
	00 0 02515		90	SDERR
C1144	20 4 05015	+	STA	FS0.4
	50 0 00000			
C1145	54 4 07600	+	ISK	76000.4
	75 0 01140		SLJ	LOOP8
C1146	75 0 01137		SLJ	DTHM
	50 0 00000			
C1147	75 0 00000	KAT1	SLJ	0.4
	50 4 00000		ENI	0.4
C1150	12 4 54035	LOOP9	LDA	FS5.4
	15 4 05015		SUB	FS0.4
C1151	20 4 54035		STA	FS5.4
	50 0 00000			
C1152	54 4 07600	+	ISK	76000.4
	75 0 01150		SLJ	LOOP9
C1153	75 0 01147		SLJ	KAT1
	50 0 00000			
C1154	75 0 00000	UGEOS1	SLJ	0.4
	50 0 00000			
C1155	75 4 04451	DIFS	RTJ	SAH
	00 0 01160		90	OUTSID5
C1156	50 0 01162	+	ENI	INSID5
	50 0 01162			
C1157	75 0 01154	+	SLJ	UGEOS1
	50 0 00000			
C1160	10 0 00000	OUTSID5	FMA	0
	20 2 24515		STA	FS2.2
C1161	75 0 01155		SLJ	DIFS
	50 0 00000			
C1162	12 2 44215	INSID5	LDA	FS4.2
	01 0 00001		ANS	1
C1163	16 0 01733		ADD	CUMST1
	20 0 01733		STA	LOCAT1

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MURGAN

01214	20 4 24515 50 0 00000		STA	FS2.2
01215	54 4 07600 75 0 01211	+	TSK SLJ	76008.5 L00P10
01216	75 0 01210 50 0 00000		SLJ	UGF05
01217	75 0 00000 50 0 00000		SLJ	**
01220	75 4 04451 00 0 01223	DIF7	RTJ 00	SAM OUTS107
01221	50 0 01225 50 0 01225	+	ENI ENI	INS107 INS107
01222	75 0 01217 50 0 00000	+	SLJ	VGE051
01223	10 0 00000 20 2 34355	OUTS107	EMA STA	2 FS3.2
01224	75 0 01220 50 0 00000		SLJ	DIF7
01225	12 2 44215 01 0 00001	INS107	LDA ARS	FS4.2 1
01226	14 0 01733 20 0 01773		ADD STA	CONST1 LOCAT1
01227	26 0 01775 20 0 01775		MUF STA	LOCAT1 LOCAT1
01230	13 2 05016 13 2 05014		LDA STA	FS0-1.2 FS0-1.2
01231	20 0 01776 12 0 01734		LDA STA	LOCAT2 CONST2
01232	26 2 63715 26 0 01776		MUF MUF	FS0.2 LOCAT2
01233	27 0 01775 20 2 34355		DVF STA	LOCAT1 FS3.2
01234	75 0 01220 50 0 00000		SLJ	DIF7
01235	75 0 00000 50 0 00000	VGE052	SLJ	**
01236	75 4 04451 00 0 01241	DIF8	RTJ 00	SAM OUTS108
01237	50 0 01243 50 0 01243	+	ENI ENI	INS108 INS108
01240	75 0 01235 50 0 00000	+	SLJ	VGE052
01241	10 0 00000 20 2 05015	OUTS108	EMA STA	0 FS0.2
01242	75 0 01236 50 0 00000		SLJ	DIF8
01243	12 2 44215 01 0 00001	INS108	LDA ARS	FS4.2 1

MURGAN

01244	14 3 01733	ADD	CONST
01245	20 3 01775	STA	LOCAT1
01246	26 3 01775	MUF	LOCAT1
01247	13 2 14254	LDA	FS1-1.2
01290	12 3 01734	SUB	FS1-1.2
01291	26 2 01775	STA	LOCAT1
01292	26 2 01775	LDA	LOCAT1
01293	26 2 01775	MUF	LOCAT1
01294	27 0 01775	MUF	LOCAT1
01295	20 2 03015	QWF	LOCAT1
01296	20 2 03015	STA	FS0.2
01297	20 2 03015	SLJ	DIFR
01298	20 2 03015	SLJ	DIFR
01299	20 2 03015	SLJ	DIFR
01300	20 2 03015	SLJ	DIFR
01301	20 2 03015	SLJ	DIFR
01302	20 2 03015	SLJ	DIFR
01303	20 2 03015	SLJ	DIFR
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01320	20 2 03015	SLJ	DIFR
01321	20 2 03015	SLJ	DIFR
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01326	20 2 03015	SLJ	DIFR
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01333	20 2 03015	SLJ	DIFR
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01370	20 2 03015	SLJ	DIFR
01371	20 2 03015	SLJ	DIFR
01372	20 2 03015	SLJ	DIFR
01373	20 2 03015	SLJ	DIFR

MURGAJ

01274	75 0 00000 50 0 00000	LAPKIN	SLJ	**
01275	75 4 04423 00 0 63715	+	RTJ DO	SAD FS6
01276	00 0 05015 00 0 02006		DO	FSU LAPERR3
01277	75 4 04421 50 0 04424	+	RTJ FNI	SAH SAD+248
01300	50 0 04435 50 0 04435		FNI FNI	SAD+128 SAD+128
01301	50 4 00000 50 0 00000		FNI	0,4
01302	12 4 63715 20 4 63715	ABS	LDA PUP	FS6,4 FS6,4
01303	20 4 63715 50 0 00000		STA	FS6,4
01304	54 4 07600 75 0 01302	+	ISK SLJ	76008,4 ARS
01305	75 0 01274 50 0 00300		SLJ	LAPKIN
01306	75 0 00300 50 4 00000	KAT2	SLJ FNI	** 0,4
01307	12 4 54355 15 4 95015	LOOPI3	LDA SUN	FS5,4 FSJ,4
01310	15 4 63715 15 4 44215		SUB SUB	FS6,4 FS4,4
01311	20 4 95215 50 0 00000		STA	FS0,4
01312	54 4 97600 75 0 01307	+	ISK SLJ	76008,4 LOOPI3
01313	75 0 01306 50 0 00000		SLJ	KAT2
01314	75 0 00300 50 0 00000	READ01	SLJ	**
01315	12 0 02001 16 0 01751	+	LDA LDO	TIME NAMES
01316	75 4 04231 00 0 00000	+	RTJ DO	MAG 0,0
01317	50 0 02014 50 0 01200		FNI FNI	MAA 12008
01320	50 0 44215 50 0 02307		FNI FNI	FS4 READERR
01321	75 0 01314 50 0 00000		SLJ	READ01
01322	75 0 00000 50 0 00300	UNPCK01	SLJ FNI	** 0,6
01323	75 0 01323 00 0 44215	+	SLJ DO	**2 FS4



MIRGAY

01354	75 0 01462		SLJ	MURVC
01355	75 0 02100		SLJ	0.4
01356	75 0 00000		LS	F55.4
01357	75 0 00001		SLJ	LOCAT1
01358	75 0 01775		SLJ	F55.4
01359	75 0 00001		SLJ	LOCAT2
01360	75 0 01775		SLJ	LOCAT1
01361	75 0 01775		SLJ	LOCAT2
01362	75 0 00000		SLJ	F55.4
01363	75 0 07999		SLJ	76020.4
01364	75 0 01355		SLJ	MURVC
01365	75 0 00000		SLJ	0.4
01366	75 0 00000		SLJ	F55.4
01367	75 0 00016		SLJ	14
01370	75 0 00000		SLJ	F55.4
01371	75 0 07600		SLJ	76020.4
01372	75 0 01366		SLJ	LOCAT1
01373	75 0 00000		SLJ	ARS DIV
01374	75 0 00000		SLJ	0.4
01375	75 0 00015		SLJ	F55.4
01376	75 0 07600		SLJ	F55.4
01377	75 0 01373		SLJ	76020.4
01378	75 0 00000		SLJ	KAT
01379	75 0 00000		SLJ	0.4
01380	75 0 00000		SLJ	F55.4
01381	75 0 00001		SLJ	F55.4
01382	75 0 01757		SLJ	LOCAT1
01383	75 0 00001		SLJ	LOCAT2
01384	75 0 01757		SLJ	LOCAT1
01385	75 0 01757		SLJ	LOCAT2
01386	75 0 01757		SLJ	LOCAT1
01387	75 0 01757		SLJ	LOCAT2
01388	75 0 01757		SLJ	LOCAT1
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01400	75 0 01757		SLJ	LOCAT1
01401	75 0 01757		SLJ	LOCAT2
01402	75 0 01757		SLJ	LOCAT1
01403	75 0 01757		SLJ	LOCAT2

MERGE:

01404	12 0 01740	STA	NAME2
01405	12 0 01744	LDA	NAME3A
01406	12 0 01747	STA	NAME3
01407	12 0 01748	LDA	NAME4A
01408	12 0 01755	STA	NAME4
01409	12 0 01761	LDA	NAME6A
01410	20 0 01754	STA	NAME6
01411	20 0 01761	LDA	LEVEL2
01412	20 0 01515	STA	TITLE+3
01413	20 0 01508	STA	TITLE1+3
01414	20 0 01613	STA	TITLE2+3
01415	20 0 01633	STA	TITLE3+3
01416	20 0 01681	STA	TITLE4+3
01417	12 0 01731	STA	TITLE5+3
01418	12 0 01763	STA	TITLE6+3
01419	12 0 01763	STA	TITLE7+3
01420	12 0 01763	STA	TITLE8+3
01421	12 0 01763	STA	A1
01422	12 0 01763	STA	A2
01423	12 0 01763	STA	B1
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01425	12 0 01763	STA	B3
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MORGAN

01434	12 0 01724	STA	NAME6
01435	20 0 01471	LDA	LEVEL3
01436	20 0 01514	STA	TITLE*3
01437	20 0 01541	STA	TITLE1*2
01438	20 0 01564	STA	TITLE*3
01439	20 0 01581	STA	TITLE*3
01440	20 0 01598	STA	TITLE*3
01441	20 0 01615	STA	TITLE*3
01442	12 0 01624	LDA	TITLE*3
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01444	12 0 01658	LDA	AL
01445	12 0 01674	LDA	AL
01446	12 0 01691	LDA	AL
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01494	12 0 02491	LDA	AL
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01569	12 0 03741	LDA	AL
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MIRGA 4

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W:KGMJ

01514	51 2 37163 71 2 33020	TITLE1	BCD	4, LAPLACIAN OF VORTICITY LAYER 1
01515	43 6 13045 51 2 00120	TITLE1	BCD	4, LAPLACIAN OF VORTICITY LAYER 1
01516	75 0 01473 50 0 00000	PRINT2	SLJ	PRINT1
01517	75 0 00000 10 0 00012	PRINT2	SLJ ENA	00 10
01520	30 0 00017 30 0 00000		STA	17B
01521	75 0 01525 00 0 00000		SLJ 00	00 0
01522	00 0 05015 00 0 03713		00 00	F50 F50
01523	00 0 05015 00 0 00047 00 0 00035		00 00	F50 39 29
01524	00 0 00022 00 0 00010		00 00	10 0
01525	75 4 04745 00 0 00000	SKIP	RIJ 00	WAE 0
01526	75 4 02524 00 0 03715		RIJ 00	MAC F50.0
01527	75 0 01517 77 7 03715		SLJ 77	PRINT2 F50.1
01530	10 0 02000 00 0 00001		10 00	TAU 1
01531	00 0 00000 00 0 00000		00 00	0
01532	20 0 00000 00 0 00000		DEC	50-1047
01533	00 0 00000 00 0 00000		00 00	0
01534	00 6 31463 14 6 31463		OEC	250-3047
01535	00 0 00026 00 0 00026		00 00	22 22
01536	20 2 50551 23 2 00731	TITLE2	BCD	4, VERT GRAD OF VT LAYER 1
01537	61 6 42046 66 2 02523	TITLE2	BCD	4, VERT GRAD OF VT LAYER 1
01540	20 2 02020 20 2 02020	TITLE2	BCD	4, VERT GRAD OF VT LAYER 1
01541	43 6 13045 51 2 00120	TITLE2	BCD	4, VERT GRAD OF VT LAYER 1
01542	75 0 01517 50 0 00000		SLJ	PRINT2
01543	75 0 00000 10 0 00012	PRINT3	SLJ ENA	00 10

FORM 1

01544	00 0 00117	STA	170	
01545	75 0 01551	SLJ	00	
01546	00 0 00000	00	00	
01547	00 0 00000	FSJ	FSJ	
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01568	00 0 00000	FSJ	FSJ	
01569	00 0 00000	FSJ	FSJ	
01570	00 0 00000	FSJ	FSJ	
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01572	00 0 00000	FSJ	FSJ	
01573	00 0 00000	FSJ	FSJ	

PURCAR

01574	00 0 00022	00 0 00010	00 0 00022	10		
01575	75 4 04745	00 0 00000	00 0 00000	RTJ	MAE	
01576	75 4 04745	00 0 00000	00 0 00000	RTJ	MAC	
01577	75 9 01567	77 7 63715	75 9 01567	SLJ	PRINT4	
01600	10 0 02000	00 0 00001	10 0 02000	10	TAU	
01601	00 0 00000	00 0 00000	00 0 00000	PCY	0	
01602	00 0 00000	00 0 00000	00 0 00000	DEC	5D-1847	
01603	00 0 00000	00 0 00000	00 0 00000	PCY	0	
01604	03 1 46314	00 0 00000	00 0 00000	DEC	1D-1847	
01605	00 0 00026	00 0 00026	00 0 00026	00	22	
01606	20 2 37143	65 2 37143	20 2 37143	BCD	4, KINETIC ENERGY	LAYER 1
01607	20 4 34595	51 4 34595	20 4 34595	BCD	4, KINETIC ENERGY	LAYER 1
01608	20 2 82020	20 2 82020	20 2 82020	BCD	4, KINETIC ENERGY	LAYER 1
01609	43 4 13065	51 2 60120	43 4 13065	BCD	4, KINETIC ENERGY	LAYER 1
01610	75 0 01567	50 0 00000	75 0 01567	SLJ	PRINT4	
01611	75 0 00000	10 0 00012	75 0 00000	SLJ	00	
01612	20 0 00017	50 0 00000	20 0 00017	STA	17B	
01613	75 0 01621	00 0 00000	75 0 01621	SLJ	00	
01614	00 0 43713	00 0 43713	00 0 43713	00	FS6	
01615	00 0 00047	00 0 00035	00 0 00047	00	39	
01616	00 0 00022	00 0 00010	00 0 00022	00	18	
01617	75 4 04745	00 0 00000	75 4 04745	RTJ	MAE	
01618	75 4 02324	00 0 63715	75 4 02324	RTJ	MAC	
01619	75 0 01613	77 7 63715	75 0 01613	SLJ	PRINTS	

MIRCA

C1624	12 0 00000	12 0 00000	TAU		
C1625	00 0 00000	00 0 00000	0		
C1626	00 0 00000	00 0 00000	50-1047		
C1627	00 0 00000	00 0 00000	0		
C1630	00 0 00000	00 0 00000	10-1047		
C1631	00 0 00000	00 0 00000	0		
C1632	00 0 00000	00 0 00000	0		
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C1637	00 0 00000	00 0 00000	0		
C1640	00 0 00000	00 0 00000	0		
C1641	00 0 00000	00 0 00000	0		
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C1644	00 0 00000	00 0 00000	0		
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C1646	00 0 00000	00 0 00000	0		
C1647	00 0 00000	00 0 00000	0		
C1650	00 0 00000	00 0 00000	0		
C1651	00 0 00000	00 0 00000	0		
C1652	00 0 00000	00 0 00000	0		
C1653	00 0 00000	00 0 00000	0		

WIRGINIA

[illegible]

MURCAN

01704	00 0 02120	TITLE7	RCD	4. PROG KAT FIELD	LAYER 1
01705	43 0 13065	TITLE7	RCD	4. PROG KAT FIELD	LAYER 1
01706	51 2 00120		SLJ	PRINT7	
01707	75 2 01683		SLJ		
01708	50 2 00060	PRINT8	LNA		
01709	75 3 00000		STA	178	
01710	20 0 00017				
01711	50 0 00000		SLJ	0	
01712	75 0 00000		00	F31	
01713	00 0 14555		00	F36	
01714	00 0 83715		00	39	
01715	00 0 00007		00	29	
01716	00 0 00005		00	14	
01717	00 0 00022		RIJ	MAC	
01718	65 4 04545		00	5	
01719	50 0 00003		RIJ	MAC	
01720	75 4 02524		00	F36.0	
01721	75 0 83715		SLJ	PRINT8	
01722	77 7 83715		00	F36.7	
01723	10 0 02300		10	TAU	
01724	00 0 00351		00	1	
01725	00 0 00000		00	0	
01726	00 0 00000		DEC	50-1847	
01727	00 0 00000		00	0	
01728	00 0 00000		DEC	10-1047	
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01922	00 0 00000		00	0	
01923	00 0 00000		00	0	
01924	00 0 00000		00	0	
01925	00 0 00000		00	0	
01926	00 0 00000		00	0	
01927	00 0 00000		00	0	
01928	00 0 00000		00	0	
01929	00 0 00000		00	0	
01930	00 0 00000		00	0	
01931	00 0 00000		00	0	
01932	00 0 00000		00	0	
01933	00 0 00000		00	0	
01934	00 0 00000		00	0	
01935	00 0 00000		00	0	
01936	00 0 00000		00	0	
01937	00 0 00000		00	0	
01938	00 0 00000		00	0	
01					

## MORGAN

01734	05 5 11512 02 5 77555	CONST2	DEC	176370-5847
01735	64 2 02003 12 1 22020	NAME1	OCT	6420200312122020
01736	64 2 02002 12 1 22020	NAME1A	OCT	6420200212122020
01737	64 2 02001 12 1 22020	NAME1B	OCT	6420200112122020
01740	64 2 02005 12 1 22020	NAME2	OCT	6420200512122020
01741	64 2 02003 12 1 22020	NAME2A	OCT	6420200312122020
01742	64 2 02002 12 1 22020	NAME2B	OCT	6420200212122020
01743	23 2 02003 12 1 22020	NAME3	OCT	2320200312122020
01744	23 2 02002 12 1 22020	NAME3A	OCT	2320200212122020
01745	23 2 02001 12 1 22020	NAME3B	OCT	2320200112122020
01746	23 2 02005 12 1 22020	NAME4	OCT	2320200512122020
01747	23 2 02003 12 1 22020	NAME4A	OCT	2320200312122020
01750	23 2 02002 12 1 22020	NAME4B	OCT	2320200212122020
01751	46 4 46720 03 1 21220	NAME5	OCT	4644672003121220
01752	46 4 46720 02 1 21220	NAME5A	OCT	4644672002121220
01753	46 4 46720 01 1 21220	NAME5B	OCT	4644672001121220
01754	46 4 46720 05 1 21220	NAME6	OCT	4644672005121220
01755	46 4 46720 03 1 21220	NAME6A	OCT	4644672003121220
01756	46 4 46720 02 1 21220	NAME6B	OCT	4644672002121220
01757	17 7 77777 17 7 77777	COUNT	OCT	1777777777777777
01760	17 7 77777 17 7 77777	COUNT1	OCT	1777777777777777
01761	43 6 13065 51 2 00320	LEVEL2	OCT	4361306551200220
01762	43 6 13065 51 2 00320	LEVEL3	OCT	4361306551200320
01763	07 2 47764 15 0 14743	A2	OCT	0724776415014743

MORGAN

01764	11 3 33231	A3	OCT	1133233141120344
01765	41 1 20344	B2	OCT	0103067572026573
01766	91 0 30875	B3	OCT	0103067572026573
01767	92 0 26573	C2	OCT	0273400000000000
01770	02 7 34000	C3	OCT	0273400000000000
01771	00 0 00000	D2	OCT	7701257777777777
01772	77 0 12577	D3	OCT	7730237777777777
01773	77 3 98377	E2	OCT	2
01774	00 0 00000	F3	OCT	2
01775	00 0 00000	LOCAT1	ASS	1
01776	00 0 00002	LOCAT2	BSS	1
01777	01776	TAPUNIT	OCT	50001200
02000	00 0 00000	TAPU	DEC	24
02001	00 0 00030	TIME	OCT	1212120512010605
02002	12 1 1205	WATER	SLS	MMAT
02003	76 0 01027	JACERR	SLS	MOORE
02004	50 0 00000	LAPERR1	SLS	LAPLAC1
02005	76 0 01014	LAPERR2	SLS	LAPLAC2
02006	50 0 00000	LAPERR3	SLS	LAPKIN
02007	76 0 01274	READER	SLS	RCAD01
02010	50 0 00000	SOERR	SLS	DYHM
02011	76 0 00774	WORTER1	SLS	VORTIS1
02012	50 0 00000	WORTER2	SLS	VORTIS2
02013	76 0 01001	WINDERR	SLS	REWIND
02013	50 0 00761			
02013	50 0 00000			



MI 0001

02014	02524	MAA	LIB	MAA
02524	04231	MAC	LIB	MAC
04231	04371	MAG	LIB	MAG
04371	04423	SAB	LIB	SAB
04423	04451	SAD	LIB	SAD
04451	04535	SAH	LIB	SAH
04535	04570	SAI	LIB	SAI
04570	04611	SAJ	LIB	SAJ
04611	04664	SAR	LIB	SAR
04664	04715	VAB	LIB	VAB
04715	04745	WAB	LIB	WAB
04745	05315	WAE	LIB	WAE
05315	14455	FSO	RSS	4000
14455	24515	FSI	RSS	4100
24515	34555	FS2	DSS	4000
34555	44215	FS3	RSS	4000
44215	54555	FS4	RSS	4000
54555	63715	FS5	RSS	4000
63715	73555	FS6	RSS	4000
73555	00306		END	

**8. APPENDIX C**

**PRINTED FIELDS FROM THE RESEARCH PROGRAM FOR 00Z 23 FEB 65**

J021	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
-501	-434	-327	-168	-069	-109	-146	-204	-206	-197	-169	-132	-114	-163	-281	-413	-402	-537	-544	-509	-488	-525	
J020	-451	-418	-250	-130	-140	-216	-236	-201	-181	-159	-119	-144	-278	-432	-529	-584	-404	-674	-506	-593	-620	
J019	-650	-608	-509	-360	-287	-248	-241	-250	-200	-154	-109	-135	-214	-345	-515	-394	-024	-050	-058	-459	-443	
J018	-702	-667	-601	-517	-433	-371	-338	-285	-194	-130	-117	-190	-264	-379	-513	-588	-612	-844	-676	-881	-878	
J017	-734	-708	-666	-606	-542	-477	-457	-303	-196	-128	-105	-249	-299	-357	-453	-518	-526	-551	-605	-637	-646	
J016	-763	-747	-712	-666	-610	-530	-422	-313	-211	-144	-172	-241	-335	-379	-492	-376	-374	-420	-532	-580	-597	
J015	-781	-777	-740	-685	-618	-517	-406	-316	-238	-177	-167	-191	-220	-249	-298	-240	-218	-214	-271	-297	-498	
J014	-787	-774	-727	-660	-575	-465	-376	-315	-256	-209	-176	-183	-162	-151	-143	-125	-118	-137	-245	-349	-448	
J013	-792	-764	-715	-656	-531	-427	-365	-322	-279	-237	-184	-189	-138	-100	-087	-097	-114	-186	-207	-381	-467	
J012	-798	-761	-719	-633	-512	-411	-362	-337	-320	-320	-215	-170	-127	-080	-047	-105	-154	-215	-333	-442	-507	
J011	-797	-752	-705	-625	-505	-420	-384	-368	-361	-339	-283	-222	-156	-044	-093	-341	-133	-192	-327	-471	-558	
J010	-792	-754	-713	-641	-542	-488	-463	-433	-415	-409	-382	-381	-239	-120	-051	-074	-108	-187	-332	-474	-578	
J009	-791	-767	-741	-666	-617	-581	-551	-515	-505	-492	-489	-430	-337	-283	-243	-215	-280	-410	-524	-622	-699	
J008	-795	-775	-756	-719	-677	-643	-608	-579	-581	-566	-536	-584	-458	-439	-416	-417	-473	-548	-622	-806	-757	
J007	-803	-785	-767	-739	-708	-679	-645	-626	-627	-621	-615	-613	-600	-584	-574	-596	-629	-677	-721	-778	-812	
J006	-812	-800	-784	-758	-733	-704	-676	-646	-608	-603	-607	-673	-667	-657	-657	-688	-684	-713	-755	-797	-836	
J005	-818	-809	-798	-776	-750	-727	-703	-682	-692	-690	-688	-714	-709	-717	-732	-744	-765	-802	-841	-888	-883	
J004	-824	-815	-807	-791	-772	-755	-727	-706	-719	-727	-725	-741	-752	-754	-768	-781	-786	-803	-832	-885	-894	
J003	-827	-820	-813	-804	-793	-778	-756	-739	-742	-757	-767	-775	-784	-792	-804	-813	-818	-831	-853	-895	-894	
J002	-831	-825	-821	-815	-806	-792	-777	-767	-769	-782	-792	-796	-809	-817	-822	-830	-842	-855	-849	-889	-878	
J001	-834	-831	-827	-814	-801	-787	-782	-789	-800	-807	-812	-820	-828	-832	-842	-855	-865	-873	-874	-885	-858	
J000	-835	-834	-831	-827	-820	-811	-802	-800	-805	-813	-817	-818	-822	-832	-840	-848	-857	-864	-868	-865	-832	

1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021

LOWER LEVEL 2 FIELD LAYER 1

400. 24 HOURS

002 23 FEB 65

1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021

-041 -042 -043 -044 -045 -046 -047 -048 -049 -050 -051 -052 -053 -054 -055 -056 -057 -058 -059 -060 -061 -062

-063 -064 -065 -066 -067 -068 -069 -070 -071 -072 -073 -074 -075 -076 -077 -078 -079 -080 -081 -082 -083

-084 -085 -086 -087 -088 -089 -090 -091 -092 -093 -094 -095 -096 -097 -098 -099 -100 -101 -102 -103 -104

-105 -106 -107 -108 -109 -110 -111 -112 -113 -114 -115 -116 -117 -118 -119 -120 -121 -122 -123 -124

-125 -126 -127 -128 -129 -130 -131 -132 -133 -134 -135 -136 -137 -138 -139 -140 -141 -142 -143 -144

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-165 -166 -167 -168 -169 -170 -171 -172 -173 -174 -175 -176 -177 -178 -179 -180 -181 -182 -183 -184

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-205 -206 -207 -208 -209 -210 -211 -212 -213 -214 -215 -216 -217 -218 -219 -220 -221 -222 -223 -224

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-425 -426 -427 -428 -429 -430 -431 -432 -433 -434 -435 -436 -437 -438 -439 -440 -441 -442 -443 -444

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-1005 -1006 -1007 -1008 -1009 -1010 -1011 -1012 -1013 -1014 -1015 -1016 -1017 -1018 -1019 -1020 -1021

1006 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021

J021 -024 -029 -033 -030 -004 -040 -017 -022 -014 -011 -017 -011 -011 -020 -015 -010 -005 -004 -3 -010 -000 -000

J020 -024 -032 -034 -019 -027 -022 -017 -014 -011 -019 -012 -002 -000 -021 -016 -013 -004 -007 -011 -006 -012

J019 -010 -029 -032 -033 -037 -020 -012 -009 -034 -010 -006 -020 -032 -004 -017 -011 -017 -010 -007 -016 -012 -013

J018 -012 -024 -031 -020 -015 -017 -005 -000 -006 -000 -033 -024 -011 -013 -000 -019 -000 -009 -013 -011 -009

J017 -013 -015 -026 -046 -022 -024 -030 -030 -036 -010 -030 -030 -015 -006 -011 -000 -017 -010 -020 -015 -007

J016 -010 -013 -016 -019 -024 -030 -040 -023 -016 -015 -030 -030 -006 -016 -010 -010 -004 -000 -010 -010

J015 -018 -020 -046 -034 -045 -046 -034 -021 -013 -012 -012 -016 -025 -010 -010 -020 -000 -021 -030 -020 -011

J014 -022 -033 -044 -052 -020 -013 -007 -013 -012 -012 -016 -025 -010 -010 -020 -000 -021 -030 -020 -014

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J012 -007 -010 -019 -055 -064 -04 -014 -023 -014 -010 -010 -010 -010 -010 -010 -010 -010 -010 -010 -011

J011 -030 -010 -009 -081 -072 -026 -037 -000 -019 -022 -032 -040 -010 -004 -010 -004 -010 -017 -016 -020

J010 -060 -011 -011 -030 -064 -06 -060 -009 -035 -020 -020 -040 -004 -000 -020 -004 -040 -037 -040 -020 -027

J009 -070 -004 -010 -020 -073 -062 -000 -040 -021 -010 -032 -021 -000 -072 -004 -040 -040 -040 -020 -030

J008 -070 -007 -031 -010 -010 -007 -022 -034 -040 -022 -004 -012 -002 -040 -040 -030 -030 -000 -040 -040

J007 -013 -040 -056 -030 -037 -044 -024 -010 -040 -000 -037 -040 -000 -033 -043 -064 -073 -060 -007 -044 -042

J006 -023 -010 -071 -044 -034 -030 -004 -020 -020 -040 -040 -027 -027 -035 -044 -061 -073 -004 -077 -000 -031 -039

J005 -079 -042 -013 -056 -040 -030 -020 -040 -020 -040 -020 -040 -020 -040 -020 -040 -020 -040 -020 -040 -020 -042

J004 -060 -021 -050 -064 -003 -080 -059 -031 -042 -061 -075 -000 -020 -041 -004 -000 -020 -041 -000 -020 -037

J003 -052 -094 -030 -030 -000 -060 -043 -050 -040 -000 -060 -070 -040 -050 -070 -002 -000 -041 -014 -000 -030

J002 -020 -050 -094 -003 -080 -059 -031 -042 -061 -075 -000 -020 -041 -004 -000 -020 -041 -000 -020 -037

J001 -070 -060 -067 -064 -080 -076 -025 -004 -065 -070 -010 -030 -040 -017 -071 -007 -009 -043 -037 -017 -010 -010

J000 -080 -060 -056 -052 -077 -060 -044 -050 -050 -070 -017 -010 -010 -000 -050 -091 -066 -000 -064 -000 -031 -041

1006 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021

VERT GNAD UP VT - LAYER 1 -200. 24 HOURS 002 23 FEB 65

65

**068 23 FEB 65**

J021	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
	-000	-000	-010	-113	-000	-000	-000	-000	-000	-000	-000	-000	-000	-000	-000	-000	-002	-001	-002	-001	-002	-002
J020	-002	-000	-014	-305	-005	-001	-000	-000	-001	-000	-000	-000	-000	-001	-000	-000	-000	-001	-001	-002	-002	-001
J019	-000	-000	-003	-002	-022	-011	-001	-000	-002	-000	-000	-000	-000	-000	-014	-002	-000	-000	-000	-000	-000	-000
J018	-000	-000	-000	-003	-012	-008	-000	-004	-005	-000	-000	-000	-000	-000	-000	-000	-000	-000	-000	-000	-000	-000
J017	-000	-000	-000	-001	-001	-000	-004	-013	-004	-000	-001	-002	-001	-001	-000	-002	-007	-011	-007	-001	-000	-010
J016	-000	-000	-000	-000	-002	-009	-017	-019	-006	-000	-001	-001	-001	-000	-000	-003	-016	-025	-033	-019	-002	-001
J015	-000	-000	-001	-002	-000	-016	-016	-011	-003	-000	-000	-000	-000	-001	-004	-013	-005	-000	-002	-000	-000	-000
J014	-000	-000	-002	-305	-012	-019	-004	-002	-000	-000	-000	-000	-000	-000	-000	-002	-000	-001	-004	-004	-004	-002
J013	-000	-001	-005	-020	-030	-027	-004	-000	-000	-000	-000	-000	-000	-000	-000	-000	-000	-000	-000	-000	-001	-001
J012	-000	-002	-000	-044	-054	-020	-002	-001	-001	-000	-000	-000	-000	-000	-000	-000	-001	-002	-013	-000	-001	-000
J011	-002	-007	-012	-053	-040	-003	-002	-005	-002	-005	-009	-003	-001	-002	-000	-000	-004	-023	-000	-000	-000	-000
J010	-002	-006	-012	-006	-010	-024	-010	-015	-017	-010	-007	-000	-000	-000	-000	-000	-000	-000	-000	-000	-000	-000
J009	-002	-002	-004	-006	-004	-021	-020	-023	-013	-009	-016	-016	-011	-011	-011	-011	-011	-011	-011	-011	-011	-011
J008	-001	-001	-002	-002	-004	-002	-004	-006	-004	-004	-009	-027	-011	-011	-011	-011	-011	-011	-011	-011	-011	-011
J007	-001	-001	-000	-000	-000	-000	-000	-002	-002	-003	-009	-015	-011	-011	-011	-011	-011	-011	-011	-011	-011	-011
J006	-000	-000	-011	-000	-000	-000	-000	-001	-002	-003	-003	-005	-012	-010	-020	-041	-032	-013	-007	-000	-005	-002
J005	-000	-000	-000	-000	-000	-000	-000	-000	-000	-000	-000	-000	-000	-000	-000	-000	-000	-000	-000	-000	-000	-000
J004	-000	-000	-000	-000	-000	-000	-000	-003	-003	-004	-007	-005	-004	-000	-010	-000	-004	-001	-000	-000	-000	-000
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1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021

KINT ENERGY DIFF LAYER 1 PROG. 24 HOURS 002 23 FEB 65



1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021

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CHRG IN ALPHABETIC ENERGY LAYER 1

PROG. 24 HOURS

002 23 FEB 65



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PHOR MAT FIELD - LAYER 1 - PAGE. 24 HOURS 002 23 FEB 65





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VERY GRAD GS VT - LAYER 2 PH03. 24 HOURS 0002 23 FEB 65

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KINT ENERGY DIFF LAYER 2 PROG. 24 MOUN2 002 23 FEB 65

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 J003 -000 -000 -000 -000 -001 -001 -024 -000 -000 -000 -000 -000 -003 -000 -001 -002 -000 -000 -000 -000  
 J002 -000 -000 -000 -000 -000 -003 -003 -002 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -001 -000  
 J001 -000 -000 -000 -000 -000 -000 -000 -001 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000  
 J000 -000

1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021

-13M -124 -042 -272 -270 -059 -133 -122 -109 -016 -007 -010 -071 -240 -280 -045 -072 -087 -068 -034 -239 -129

-111 -002 -161 -316 -242 -113 -074 -109 -066 -076 -039 -115 -004 -071 -123 -085 -014 -047 -055 -106 -008 -182

-005 -012 -303 -226 -103 -159 -079 -012 -035 -013 -050 -262 -202 -094 -061 -057 -029 -005 -077 -078 -032 -009

-025 -021 -062 -194 -167 -014 -006 -117 -112 -038 -071 -102 -125 -139 -013 -049 -012 -044 -009 -112 -100 -173

-091 -046 -001 -156 -142 -061 -042 -032 -148 -246 -081 -210 -012 -233 -078 -036 -081 -063 -005 -036 -015 -011

-048 -097 -135 -049 -021 -125 -132 -127 -008 -107 -048 -161 -055 -046 -123 -069 -159 -141 -202 -059 -134 -011

-067 -054 -057 -074 -002 -160 -063 -152 -096 -040 -081 -020 -099 -003 -008 -215 -120 -142 -263 -007 -022 -061

-101 -042 -040 -161 -267 -21 -22 -119 -069 -012 -003 -124 -060 -050 -167 -162 -057 -093 -166 -103 -202 -002

-124 -152 -012 -167 -220 -134 -517 -14 -218 -123 -038 -039 -091 -089 -012 -138 -026 -071 -064 -045 -294 -180

-044 -170 -029 -119 -315 -065 -037 -23 -261 -046 -091 -013 -174 -063 -048 -159 -11 -148 -132 -053 -246

-026 -115 -313 -24 -295 -014 -023 -009 -120 -110 -42 -042 -219 -038 -082 -243 -300 -282 -252 -131 -014 -381

-057 -211 -311 -202 -234 -425 -351 -349 -181 -077 -23 -260 -033 -151 -094 -083 -350 -311 -043 -194 -277

-096 -236 -034 -167 -295 -139 -119 -220 -27 -014 -016 -237 -515 -729 -748 -325 -664 -501 -130 -126 -131

-184 -163 -092 -245 -251 -088 -040 -043 -118 -065 -217 -153 -422 -503 -772 -917 -912 -925 -453 -369 -281 -152

-126 -167 -189 -116 -131 -011 -439 -349 -043 -148 -276 -103 -030 -176 -019 -547 -624 -348 -217 -377 -414 -115

-043 -106 -122 -146 -146 -138 -091 -062 -378 -173 -022 -093 -315 -646 -470 -218 -249 -253 -168 -113 -280 -144

-041 -060 -123 -148 -245 -042 -102 -249 -197 -071 -011 -081 -352 -443 -195 -144 -236 -186 -043 -030 -030

-095 -058 -077 -142 -177 -045 -352 -788 -022 -023 -506 -088 -088 -088 -088 -088 -088 -088 -088 -088 -088 -088

-131 -099 -039 -042 -067 -091 -048 -29 -203 -235 -12 -039 -232 -221 -058 -052 -194 -183 -056 -092 -015 -110

-130 -140 -086 -042 -063 -086 -054 -098 -119 -117 -039 -086 -145 -009 -020 -105 -023 -021 -021 -097 -031 -029

-050 -119 -142 -103 -005 -030 -233 -226 -013 -064 -069 -048 -063 -078 -259 -235 -136 -040 -146 -162 -007 -050

-050 -064 -133 -065 -042 -073 -272 -021 -061 -093 -028 -057 -016 -079 -303 -121 -020 -007 -171 -194 -080 -126

1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021

PROG KAT FIELD - LAYER 2 -NOG. 24 HOURS 002 23 FEB 65

1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021

J021 -019 +012 +002 -019 +006 -033 -026 -001 +041 +015 -002 -005 +004 -001 +004 -003 -014 -004 -011 -031 -022 -003

J020 -012 -015 -005 -015 -019 -009 -071 -114 -024 -016 -024 -001 -009 -020 -074 -015 -003 -017 -013 -002 -003

J019 -020 -016 -001 -003 -02 -004 -06 -044 -037 -015 -018 -016 -000 -004 -035 -034 -026 -014 -014 -012 -002 -003

J018 -013 -007 -002 -016 -01 -005 -032 -061 -003 -021 -000 -002 -018 -011 -013 -016 -016 -001 -002 -003 -002 -000

J017 -003 -002 -004 -022 -013 -013 -017 -14 -002 -022 -02 -009 -023 -003 -001 -000 -006 -001 -001 -004 -004 -002

J016 -001 -001 -011 -006 -030 -024 -024 -024 -024 -024 -024 -024 -024 -024 -024 -024 -024 -024 -024 -024 -024 -000

J015 -000 -007 -002 -007 -026 -127 -213 -031 -001 -001 -001 -001 -001 -001 -001 -001 -001 -001 -001 -001 -000

J014 -002 -000

J013 -007 -040 -000 -000 -017 -011 -245 -003 -002 -002 -013 -047 -043 -016 -031 -013 -023 -030 -011 -010 -009

J012 -005 -013 -005 -013 -031 -004 -333 -131 -074 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000

J011 -004 -003 -112 -006 -143 -205 -197 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000

J010 -025 -151 -170 -000 -131 -210 -031 -027 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000

J009 -052 -073 -045 -009 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000

J008 -030 -031 -002 -043 -043 -025 -094 -041 -011 -017 -041 -008 -049 -056 -051 -023 -011 -002 -024 -021 -002

J007 -035 -034 -049 -027 -000 -000 -041 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000

J006 -015 -012 -030 -062 -04 -116 -147 -014 -040 -007 -022 -052 -023 -051 -050 -026 -106 -116 -090 -096 -021 -046

J005 -002 -003 -004 -037 -042 -173 -168 -011 -103 -025 -009 -036 -031 -022 -070 -067 -040 -017 -001 -004 -039 -026

J004 -001 -006 -062 -076 -139 -066 -266 -000 -073 -026 -006 -048 -015 -004 -004 -004 -004 -004 -004 -004 -004 -000

J003 -003 -004 -003 -014 -056 -000 -074 -161 -054 -039 -047 -007 -020 -022 -019 -003 -027 -040 -023 -003 -014

J002 -002 -002 -004 -009 -023 -019 -030 -068 -043 -000 -020 -012 -005 -021 -001 -003 -007 -011 -014 -004 -003 -027

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J000 -000 -000 -000 -000 -004 -010 -008 -005 -001 -006 -005 -007 -013 -002 -031 -022 -006 -011 -004 -002 -003 -000

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ADVEC OF OMEGA BY TEMP. LAYER 2 -R00. 24 HOURS 002 23 FEB 65

J021	-120	-136	-044	-031	-274	-002	-150	121	150	-001	-005	-018	-075	-219	-205	-042	-058	-083	-079	-704	-217	-127
J020	-123	-004	-154	-011	-300	-045	-092	-038	102	-102	-023	-092	-095	-062	-144	-109	-000	-051	-038	-173	-010	-179
J019	-024	-004	-302	-024	-124	-154	-073	-032	-092	-024	-032	-202	-090	-026	-091	-056	-012	-082	-050	-034	-012	
J018	-038	-015	-001	-178	-163	-019	-037	-178	-109	-017	-071	-100	-107	-123	-026	-033	-028	-054	-091	-115	-156	-175
J017	-094	-048	-003	-133	-130	-074	-069	-065	-085	-224	-079	-200	-013	-246	-079	-036	-067	-067	-066	-032	-019	-009
J016	-047	-005	-124	-059	-008	-149	-158	-175	-055	-166	-068	-129	-112	-110	-094	-069	-168	-161	-112	-064	-126	-011
J015	-061	-054	-050	-073	-009	-184	-000	-36	-138	-038	-093	-044	-134	-064	-017	-202	-098	-159	-275	-090	-022	-041
J014	-115	-050	-033	-164	-059	-109	-153	-176	-091	-014	-001	-120	-050	-147	-138	-111	-001	-004	-173	-138	-181	-003
J013	-201	-200	-003	-007	-007	-145	-272	-043	-133	-125	-040	-024	-044	-046	-005	-169	-056	-193	-034	-034	-203	-109
J012	-185	-204	-033	-124	-043	-019	-124	-186	-106	-090	-036	-129	-033	-106	-071	-059	-211	-397	-000	-000	-097	-338
J011	-185	-133	-211	-142	-152	-109	-220	-069	-130	-315	-54	-014	-244	-006	-103	-113	-222	-348	-079	-004	-411	
J010	-092	-093	-136	-116	-103	-216	-314	-376	-471	-343	-462	-071	-019	-143	-031	-045	-162	-277	-131	-030	-143	-297
J009	-044	-163	-031	-021	-293	-140	-013	-254	-022	-147	-126	-261	-537	-721	-714	-098	-333	-602	-531	-119	-144	-189
J008	-127	-132	-098	-281	-216	-093	-014	-113	-132	-062	-250	-281	-490	-040	-027	-040	-928	-033	-351	-335	-302	-255
J007	-092	-134	-141	-229	-092	-174	-580	-093	-025	-155	-319	-190	-101	-162	-106	-035	-780	-428	-227	-378	-412	-202
J006	-029	-004	-093	-084	-143	-100	-116	-048	-336	-188	-000	-144	-338	-595	-411	-000	-326	-349	-259	-167	-222	-198
J005	-039	-063	-119	-111	-205	-215	-009	-176	-094	-058	-093	-283	-118	-138	-74	-128	-098	-253	-186	-127	-069	-049
J004	-097	-059	-072	-130	-233	-085	-246	-522	-074	-051	-532	-128	-020	-062	-002	-061	-097	-187	-144	-078	-077	-044
J003	-148	-103	-043	-056	-124	-142	-025	-051	-195	-274	-205	-037	-852	-294	-043	-049	-167	-142	-023	-048	-011	-124
J002	-132	-138	-049	-052	-086	-105	-044	-165	-074	-117	-011	-098	-169	-013	-017	-102	-016	-032	-037	-061	-034	-002
J001	-031	-119	-141	-104	-006	-039	-210	-201	-001	-068	-079	-039	-035	-066	-246	-222	-132	-030	-147	-197	-091	-038
J000	-058	-084	-133	-05	-047	-063	-244	-026	-068	-098	-033	-064	-004	-001	-272	-099	-014	-098	-175	-156	-076	-123

1800 100 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021

PROG KAT FIELD LAYER 2 PROG. 24 MUMS 002 23 FEB 65







00621	75 4 00776 50 0 00000	RTJ	MOR12	♦	COMPUTES AVERAGE LEVEL OF THERMAL WIND UPPER AND LOWER LEVEL STOMS IN PSI
00622	75 4 01320 50 0 00700	RTJ	PRIM71	♦	PRINTS LAPLACIAN OF VORTICITY
00623	75 4 01003 50 0 00000	RTJ	MMAT	♦	STOMS SCALED MAP FACTOR IN 754
00624	75 4 01011 50 0 00000	RTJ	UTHM1	♦	COMPUTES V COMPONENT OF THERMAL WIND AT LOWER LEVEL STOMS IN PSI
00625	75 4 01027 50 0 00000	RTJ	UTHM2	♦	COMPUTES V COMPONENT OF THERMAL WIND AT LOWER LEVEL STOMS IN PSI
00626	75 4 01045 50 0 00000	RTJ	DUTHM	♦	COMPUTES V COMPONENT DIFFERENCE BETWEEN UPPER AND LOWER LEVEL STOMS IN PSI
00627	75 4 01052 50 0 00000	RTJ	VTMH1	♦	COMPUTES V COMPONENT OF THERMAL WIND AT LOWER LEVEL STOMS IN PSI
00630	75 4 01070 50 0 00000	RTJ	VTMH2	♦	COMPUTES V COMPONENT OF THERMAL WIND AT UPPER LEVEL STOMS IN PSI
00631	75 4 01106 50 0 00000	RTJ	DVTMH	♦	COMPUTES V COMPONENT DIFFERENCE BETWEEN UPPER AND LOWER LEVEL STOMS IN PSI
00632	75 4 01113 50 0 00000	RTJ	DTMH	♦	COMPUTES VERTICAL GRADIENT OF THERMAL WIND STOMS IN PSI
00633	75 4 01343 50 0 00000	RTJ	PRINT2	♦	PRINTS VERTICAL GRADIENT OF VT
00634	75 4 01123 50 0 00000	RTJ	KAT1	♦	MOR12 MINUS DTMH STOMS IN PSI
00635	75 4 00774 50 0 00000	RTJ	READD2	♦	SEE ABOVE
00636	75 4 00792 50 0 00000	RTJ	UNPCKD2	♦	SEE ABOVE
00637	75 4 00801 50 0 00000	RTJ	READD1	♦	SEE ABOVE
00640	75 4 00807 50 0 00000	RTJ	UNPCKD1	♦	SEE ABOVE
00641	75 4 00735 50 0 00000	RTJ	REIN10	♦	REMINDS TU 3 CH 9/6
00642	75 4 00761 50 0 00000	RTJ	REIN11	♦	REMINDS TU 2 CH 9/6
00643	75 4 00745 50 0 00000	RTJ	SIMP	♦	SEE ABOVE



00644	75 4 01303	RTJ	MIAT	SEE ABOVE
00645	75 4 01130	RTJ	UGEDS1	COMPUTES U COMPONENT OF GEOSTROPHIC WIND AT UPPER LEVEL STOMS IN FS2
00646	50 0 00000	RTJ	UGEDS2	COMPUTES U COMPONENT OF GEOSTROPHIC WIND AT LOWER LEVEL STOMS IN FS3
00647	75 4 01144	RTJ	UGEDS	COMPUTES AVERAGE U COMPONENT STOMS IN FS2
00650	50 0 00000	RTJ	VGEDS1	COMPUTES V COMPONENT OF GEOSTROPHIC WIND AT UPPER LEVEL STOMS IN FS3
00651	75 4 01211	RTJ	VGEDS2	COMPUTES V COMPONENT OF GEOSTROPHIC WIND AT LOWER LEVEL STOMS IN FS3
00652	50 0 00000	RTJ	VGEDS	COMPUTES AVERAGE V COMPONENT STOMS IN FS3
00653	75 4 01236	RTJ	KINETIC	COMPUTES V SQUARE STOMS IN FS3
00654	50 0 00000	RTJ	PRINT3	COMPUTES V SQUARE STOMS IN FS3
00655	75 4 01246	RTJ	KAT2	PRINTS KINETIC ENERGY FIELD
00656	50 0 00000	RTJ	PRINT4	STOMS PREVIOUS TERMS IN FS4
00657	75 4 01253	RTJ	LAYER2	PRINTS PROG KAT FIELD
00660	75 4 00000	SLS		COMPUTES 300 TO 200 MB LAYER
00661	50 0 00000	READD1	SLJ	END OF STEERING PROGRAM USES OFF LINE PRINTING
00662	12 0 01461	LDA	TIME	
00663	75 4 01434	RTJ	MAG	
00664	50 0 00000	MIGMD	ENI	
00665	50 0 01473	ENI	13000	
00666	50 0 01481	ENI	READER	
00667	50 0 00000	SLJ	READD1	
00668	50 0 00000	UNPKCD1	ENI	



00720	75 0 05581	+	RTJ	YAB
00721	75 0 08333		SLJ	UNPKT1
00722	75 0 08508		SLJ	..
00723	12 0 01224	+	LD	TIME
00724	75 0 03707	+	RTJ	MAG
00725	50 0 01573		ENI	MAA
00726	50 0 01463		ENI	13008
00727	75 0 08732		SLJ	FSA
00730	75 0 08008		SLJ	READER
00731	75 0 08723		SLJ	READT2
00732	50 0 04001		SLJ	..
00733	75 0 04334	+	SLJ	FSA
00734	75 0 08728	+	SLJ	FSA
00735	75 0 08008		SLJ	24338
00736	75 0 01433	+	SLJ	YAB
00737	75 0 08728	+	SLJ	UNPKT2
00740	75 0 08723		SLJ	..
00741	75 0 08208	+	SLJ	MAA
00742	75 0 01433	+	SLJ	113008
00743	75 0 08728	+	SLJ	REMINO
00744	75 0 08723	+	SLJ	WINDRR
00745	75 0 08208		SLJ	..
00746	75 0 01433	+	SLJ	MAA
00747	75 0 08728	+	SLJ	113008
00748	75 0 08723	+	SLJ	REMINO
00749	75 0 08208	+	SLJ	WINDRR
00750	75 0 01433	+	SLJ	..
00751	75 0 08728	+	SLJ	MAA
00752	75 0 08723	+	SLJ	113008
00753	75 0 08208	+	SLJ	REMINO
00754	75 0 01433	+	SLJ	WINDRR
00755	75 0 08728	+	SLJ	..
00756	75 0 08723	+	SLJ	MAA
00757	75 0 08208	+	SLJ	113008
00758	75 0 01433	+	SLJ	REMINO
00759	75 0 08728	+	SLJ	WINDRR
00760	75 0 08723	+	SLJ	..
00761	75 0 08208	+	SLJ	MAA
00762	75 0 01433	+	SLJ	113008
00763	75 0 08728	+	SLJ	REMINO
00764	75 0 08723	+	SLJ	WINDRR
00765	75 0 08208	+	SLJ	..
00766	75 0 01433	+	SLJ	MAA
00767	75 0 08728	+	SLJ	113008
00768	75 0 08723	+	SLJ	REMINO
00769	75 0 08208	+	SLJ	WINDRR
00770	75 0 01433	+	SLJ	..
00771	75 0 08728	+	SLJ	MAA
00772	75 0 08723	+	SLJ	113008
00773	75 0 08208	+	SLJ	REMINO
00774	75 0 01433	+	SLJ	WINDRR
00775	75 0 08728	+	SLJ	..
00776	75 0 08723	+	SLJ	MAA
00777	75 0 08208	+	SLJ	113008
00778	75 0 01433	+	SLJ	REMINO
00779	75 0 08728	+	SLJ	WINDRR
00780	75 0 08723	+	SLJ	..
00781	75 0 08208	+	SLJ	MAA
00782	75 0 01433	+	SLJ	113008
00783	75 0 08728	+	SLJ	REMINO
00784	75 0 08723	+	SLJ	WINDRR
00785	75 0 08208	+	SLJ	..
00786	75 0 01433	+	SLJ	MAA
00787	75 0 08728	+	SLJ	113008
00788	75 0 08723	+	SLJ	REMINO
00789	75 0 08208	+	SLJ	WINDRR
00790	75 0 01433	+	SLJ	..
00791	75 0 08728	+	SLJ	MAA
00792	75 0 08723	+	SLJ	113008
00793	75 0 08208	+	SLJ	REMINO
00794	75 0 01433	+	SLJ	WINDRR
00795	75 0 08728	+	SLJ	..
00796	75 0 08723	+	SLJ	MAA
00797	75 0 08208	+	SLJ	113008
00798	75 0 01433	+	SLJ	REMINO
00799	75 0 08728	+	SLJ	WINDRR
00800	75 0 08723	+	SLJ	..

00790	75 0 90000	WM1131	SLJ	..
00791	75 0 90000	..	..	..
00792	75 0 90000	..	..	..
00793	75 0 90000	..	..	..
00794	75 0 90000	..	..	..
00795	75 0 90000	..	..	..
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00797	75 0 90000	..	..	..
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00799	75 0 90000	..	..	..
00800	75 0 90000	..	..	..
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00838	75 0 90000	..	..	..
00839	75 0 90000	..	..	..
00840	75 0 90000	..	..	..
00841	75 0 90000	..	..	..
00842	75 0 90000	..	..	..
00843	75 0 90000	..	..	..
00844	75 0 90000	..	..	..
00845	75 0 90000	..	..	..
00846	75 0 90000	..	..	..
00847	75 0 90000	..	..	..
00848	75 0 90000	..	..	..
00849	75 0 90000	..	..	..
00850	75 0 90000	..	..	..
00851	75 0 90000	..	..	..
00852	75 0 90000	..	..	..
00853	75 0 90000	..	..	..
00854	75 0 90000	..	..	..
00855	75 0 90000	..	..	..
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00858	75 0 90000	..	..	..
00859	75 0 90000	..	..	..
00860	75 0 90000	..	..	..
00861	75 0 90000	..	..	..
00862	75 0 90000	..	..	..
00863	75 0 90000	..	..	..
00864	75 0 90000	..	..	..
00865	75 0 90000	..	..	..
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00868	75 0 90000	..	..	..
00869	75 0 90000	..	..	..
00870	75 0 90000	..	..	..
00871	75 0 90000	..	..	..
00872	75 0 90000	..	..	..
00873	75 0 90000	..	..	..
00874	75 0 90000	..	..	..
00875	75 0 90000	..	..	..
00876	75 0 90000	..	..	..
00877	75 0 90000	..	..	..

01000	28 0 00000	AMZ	FS4.2
01001	34 0 07999	SLJ	79008.4
01002	75 0 00776	SLJ	LOCPI
01003	50 0 00000	SLJ	HORIZ
01004	75 0 00000	SLJ	..
01005	75 0 04215	RTJ	SAJ
01006	50 0 01141	ENI	HAYMAN
01007	75 0 04075	RTJ	FS2
01008	50 0 04223	RTJ	SAJ+78
01009	50 0 04223	ENI	SAJ+78
01010	75 0 01003	SLJ	PHAT
01011	75 0 00000	SLJ	..
01012	75 0 04075	RTJ	SAJ
01013	50 0 01013	ENI	OUTSIDE
01014	50 0 01017	ENI	INSIDE
01015	75 0 01013	SLJ	UTMM1
01016	75 0 00000	EMA	FS0.2
01017	75 0 01013	SLJ	OIF1
01018	75 0 01013	SLJ	FS4.2
01019	75 0 01013	SLJ	COMPI
01020	75 0 01013	SLJ	LOCPI
01021	75 0 01013	SLJ	LOCPI
01022	75 0 01013	SLJ	FS2.1
01023	75 0 01013	SLJ	LOCPI
01024	75 0 01013	SLJ	LOCPI
01025	75 0 01013	SLJ	LOCPI
01026	75 0 01013	SLJ	LOCPI
01027	75 0 00000	SLJ	..

01030	75 5 01075	01F2	RTJ	80V5102
01031	75 5 01075		ENI	INS103
01032	75 5 01075		SLJ	UTM12
01033	75 5 01075	OUTS102	STA	PS1.2
01034	75 5 01075		SLJ	01F2
01035	75 5 01075	INS102	STA	PS1.2
01036	75 5 01075		RTJ	CON11
01037	75 5 01075		STA	LOC11
01040	75 5 01075		STA	LOC11
01041	75 5 01075		STA	LOC11
01042	75 5 01075		STA	LOC11
01043	75 5 01075		STA	LOC11
01044	75 5 01075		STA	LOC11
01045	75 5 01075		STA	LOC11
01046	75 5 01075		STA	LOC11
01047	75 5 01075		STA	LOC11
01050	75 5 01075		STA	LOC11
01051	75 5 01075		STA	LOC11
01052	75 5 01075		STA	LOC11
01053	75 5 01075		STA	LOC11
01054	75 5 01075		STA	LOC11
01055	75 5 01075		STA	LOC11
01056	75 5 01075		STA	LOC11
01057	75 5 01075		STA	LOC11

01060	12 2 43641	INSID4	LDA	FS4.2
01061	20 0 01435		ADD	CONST1
01062	26 0 01435		MUF	LOCAT1
01063	12 2 24142		LDA	FS2+1:2
01064	20 0 01435		STA	LOCAT2
01065	26 0 01435		MUF	FS6:2
01066	27 2 24141		DVF	LOCAT1
01067	20 2 14301		STA	FS1:2
01070	25 0 00000	VTM2	SLJ	**
01071	25 0 01075	DIF4	RTJ	SAH
01072	50 0 01076	+	ENI	OUTSID4
01073	25 0 01070	+	SLJ	INSID4
01074	10 0 00000	OUTSID4	ENA	VTM2
01075	20 2 24141		STA	PS2.2
01076	12 2 43641	INSID4	SLJ	DIF4
01077	20 0 01435		LDA	FS4.2
01100	26 0 01435		MUF	CONST1
01101	12 2 34002		LDA	LOCAT1
01102	20 0 01435		STA	FS3+1:2
01103	26 0 01435		MUF	FS3-1:2
01104	27 2 34001		DVF	LOCAT2
01105	20 2 24141		STA	LOCAT1
01106	25 0 00000	DVTM	SLJ	FS2:2
01107	12 2 24141	LOOP7	LDA	DIF4
			SLJ	**
			ENI	0:4
			LDA	FS1:4
			SUB	FS1:4

01110	20 4 14301	STA	FS1.4
01111	50 3 14445	ISK	76008.4
01112	54 4 07600	SLJ	LOOP9
01113	75 3 01117	SLJ	DVTHM
01114	75 3 01106	SLJ	0.4
01115	50 3 00300	SLJ	0.4
01116	75 2 00300	SLJ	0.4
01117	50 2 00300	SLJ	0.4
01118	12 4 04441	LDA	FS0.4
01119	12 4 04441	MUF	FS0.4
01120	20 4 14301	STA	FS0.4
01121	20 4 14301	LDA	FS0.4
01122	76 4 14301	MUF	FS0.4
01123	14 4 04441	ADD	FS0.4
01124	75 4 04441	RTJ	VAE
01125	50 3 01468	OU	SCERR
01126	20 4 04441	STA	FS0.4
01127	50 3 01468	ISK	76008.4
01128	54 4 07600	SLJ	LOOP9
01129	75 3 01113	SLJ	DVTHM
01130	50 3 00300	SLJ	0.4
01131	75 3 00300	SLJ	0.4
01132	12 4 04441	LDA	FS0.4
01133	12 4 04441	SUB	FS0.4
01134	20 4 14301	STA	FS0.4
01135	20 4 14301	ISK	76008.4
01136	54 4 07600	SLJ	LOOP9
01137	75 3 01113	SLJ	KATI
01138	50 3 00300	SLJ	0.4
01139	75 3 00300	SLJ	0.4
01140	12 4 04441	LDA	FS0.4
01141	12 4 04441	SUB	FS0.4
01142	20 4 14301	STA	FS0.4
01143	20 4 14301	ISK	76008.4
01144	54 4 07600	SLJ	LOOP9
01145	75 3 01113	SLJ	KATI
01146	50 3 00300	SLJ	0.4
01147	75 3 00300	SLJ	0.4
01148	12 4 04441	LDA	FS0.4
01149	12 4 04441	SUB	FS0.4
01150	20 4 14301	STA	FS0.4
01151	20 4 14301	ISK	76008.4
01152	54 4 07600	SLJ	LOOP9
01153	75 3 01113	SLJ	KATI
01154	50 3 00300	SLJ	0.4
01155	75 3 00300	SLJ	0.4
01156	12 4 04441	LDA	FS0.4
01157	12 4 04441	SUB	FS0.4
01158	20 4 14301	STA	FS0.4
01159	20 4 14301	ISK	76008.4
01160	54 4 07600	SLJ	LOOP9
01161	75 3 01113	SLJ	KATI
01162	50 3 00300	SLJ	0.4
01163	75 3 00300	SLJ	0.4
01164	12 4 04441	LDA	FS0.4
01165	12 4 04441	SUB	FS0.4
01166	20 4 14301	STA	FS0.4
01167	20 4 14301	ISK	76008.4
01168	54 4 07600	SLJ	LOOP9
01169	75 3 01113	SLJ	KATI
01170	50 3 00300	SLJ	0.4
01171	75 3 00300	SLJ	0.4
01172	12 4 04441	LDA	FS0.4
01173	12 4 04441	SUB	FS0.4
01174	20 4 14301	STA	FS0.4
01175	20 4 14301	ISK	76008.4
01176	54 4 07600	SLJ	LOOP9
01177	75 3 01113	SLJ	KATI
01178	50 3 00300	SLJ	0.4
01179	75 3 00300	SLJ	0.4
01180	12 4 04441	LDA	FS0.4
01181	12 4 04441	SUB	FS0.4
01182	20 4 14301	STA	FS0.4
01183	20 4 14301	ISK	76008.4
01184	54 4 07600	SLJ	LOOP9
01185	75 3 01113	SLJ	KATI
01186	50 3 00300	SLJ	0.4
01187	75 3 00300	SLJ	0.4
01188	12 4 04441	LDA	FS0.4
01189	12 4 04441	SUB	FS0.4
01190	20 4 14301	STA	FS0.4
01191	20 4 14301	ISK	76008.4
01192	54 4 07600	SLJ	LOOP9
01193	75 3 01113	SLJ	KATI
01194	50 3 00300	SLJ	0.4
01195	75 3 00300	SLJ	0.4
01196	12 4 04441	LDA	FS0.4
01197	12 4 04441	SUB	FS0.4
01198	20 4 14301	STA	FS0.4
01199	20 4 14301	ISK	76008.4



01140	26 0 01455	MUF	LOCAT1
01141	13 1 04441	LDA	FS0.1
01142	20 0 01455	STA	LOCAT2
01143	26 2 82241	MUF	FS2.2
01144	27 2 21455	DVF	LOCAT1
01145	25 0 01455	SLJ	DIF5
01146	25 0 00000	SLJ	..
01147	25 4 04272	STJ	SAW
01150	50 0 01154	ENI	OUTSID6
01151	25 0 01146	SLJ	INSID6
01152	20 2 00000	ENI	UGEOS2
01153	25 0 01147	STA	FS3.2
01154	17 2 83641	SLJ	DIF6
01155	25 0 01455	LDA	FS4.2
01156	26 0 01455	STA	LOCAT1
01157	13 1 13301	MUF	LOCAT1
01160	20 0 01455	LDA	FS1.1
01161	26 2 82241	STA	LOCAT2
01162	27 2 34551	MUF	FS2.2
01163	25 0 01147	DVF	LOCAT1
01164	25 0 00000	SLJ	FS3.2
01165	13 1 83641	SLJ	DIF6
01166	20 0 01455	ENI	..
01167	25 0 00000	LDA	FS2.4
	12 4 34551	STA	LOCAT1
	25 0 00000	ALD	FS3.4
	14 0 01455	ALD	LOCAT1

01170	20 5 24141	STA	FS2.4
01171	50 3 00100	ISK	76008.4
01172	75 3 01164	SLJ	LOCAT1
01173	75 3 00100	SLJ	UGENS
01174	75 3 00100	SLJ	..
01175	75 3 00100	SLJ	..
01176	75 3 00100	SLJ	..
01177	75 3 00100	SLJ	..
01178	75 3 00100	SLJ	..
01179	75 3 00100	SLJ	..
01180	75 3 00100	SLJ	..
01181	75 3 00100	SLJ	..
01182	75 3 00100	SLJ	..
01183	75 3 00100	SLJ	..
01184	75 3 00100	SLJ	..
01185	75 3 00100	SLJ	..
01186	75 3 00100	SLJ	..
01187	75 3 00100	SLJ	..
01188	75 3 00100	SLJ	..
01189	75 3 00100	SLJ	..
01190	75 3 00100	SLJ	..
01191	75 3 00100	SLJ	..
01192	75 3 00100	SLJ	..
01193	75 3 00100	SLJ	..
01194	75 3 00100	SLJ	..
01195	75 3 00100	SLJ	..
01196	75 3 00100	SLJ	..
01197	75 3 00100	SLJ	..
01198	75 3 00100	SLJ	..
01199	75 3 00100	SLJ	..
01200	75 3 00100	SLJ	..
01201	75 3 00100	SLJ	..
01202	75 3 00100	SLJ	..
01203	75 3 00100	SLJ	..
01204	75 3 00100	SLJ	..
01205	75 3 00100	SLJ	..
01206	75 3 00100	SLJ	..
01207	75 3 00100	SLJ	..
01208	75 3 00100	SLJ	..
01209	75 3 00100	SLJ	..
01210	75 3 00100	SLJ	..
01211	75 3 00100	SLJ	..
01212	75 3 00100	SLJ	..
01213	75 3 00100	SLJ	..
01214	75 3 00100	SLJ	..
01215	75 3 00100	SLJ	..
01216	75 3 00100	SLJ	..
01217	75 3 00100	SLJ	..

01220	15 4 31239	APU	LOCAT1
01221	20 0 01433	SYA	LOCAT1
01222	13 2 14308	STA	FS1-1:2
01223	20 0 01439	STA	LOCAT2
01224	26 2 01456	MUF	LOCAT2
01225	27 2 01453	SYA	LOCAT1
01226	75 0 08000	SLJ	DIRM
01227	75 2 08800	WGENS	0.4
01230	12 4 34004	LOA	FS3.4
01231	20 0 01455	STA	LOCAT1
01232	05 0 00003	ABS	LOCAT1
01233	20 4 04441	STA	FS0.4
01234	75 4 07000	SLJ	780011
01235	75 0 01327	SLJ	WGENS
01236	75 0 00000	KINETIC	0.4
01237	12 4 34141	LOA	FS2.2
01240	20 0 01455	STA	LOCAT1
01241	26 0 01456	MUF	LOCAT2
01242	01 0 00001	APU	LOCAT1
01243	20 0 08000	STA	FS0.4
01244	75 4 07000	SLJ	780011
01245	75 0 01327	SLJ	KINETIC
01246	75 0 00000	WGENS	0.4
01247	13 4 34201	LOA	FS3.2

01250	30 0 00000	STA	FSD.4
01251	75 0 01209	125	788915
01252	75 0 01208	SLJ	KAT2
01253	75 0 00000	STA	CO. COUNT
01254	75 0 01208	SLJ	CO. COUNT
01255	75 0 01208	SLJ	NAME2
01256	75 0 01208	SLJ	NAME2A
01257	75 0 01208	SLJ	NAME3A
01260	75 0 01208	SLJ	NAME3
01261	75 0 01208	SLJ	NAME4
01262	75 0 01208	SLJ	NAME5
01263	75 0 01208	SLJ	NAME6
01264	75 0 01208	SLJ	NAME7
01265	75 0 01208	SLJ	NAME8
01266	75 0 01208	SLJ	NAME9
01267	75 0 01208	SLJ	NAME10
01270	75 0 01208	SLJ	NAME11
01271	75 0 01208	SLJ	NAME12
01272	75 0 01208	SLJ	NAME13
01273	75 0 01208	SLJ	NAME14
01274	75 0 01208	SLJ	NAME15
01275	75 0 01208	SLJ	NAME16
01276	75 0 01208	SLJ	NAME17
01277	75 0 01208	SLJ	NAME18

01300	00 0 00147	00 00	33	
01301	00 0 00035	00 00	24	
01302	00 0 00032	00 00	18	
01303	00 0 00010	00 00	8	
01304	75 4 04371	RTJ	WAE	
01305	00 0 00000	00 00	0	
01306	75 4 03302	RTJ	MAC	
01307	00 0 03341	00 00	PS6.0	
01308	75 0 01374	SLJ	PRINT	
01309	00 0 03341	00 00	PS6.7	
01310	00 0 01460	00 00	TAU	
01311	00 0 00004	00 00	4	
01312	13 1 11710	0CT	1311171047640243	
01313	47 4 40243	0CT	0247613261070664	
01314	07 5 76132	0CT	0014260000000000	
01315	61 5 76864	0CT	0135600000000000	
01316	00 0 42600	0CT	0014260000000000	
01317	00 0 00000	0CT	0135600000000000	
01318	01 3 56000	00 00	22	
01319	00 0 00000	00 00	4, LOWER LEVEL 2 FIELD	LAYER 1
01320	00 0 00038	0CD	4, LOWER LEVEL 2 FIELD	LAYER 1
01321	20 3 12043	0CD	4, LOWER LEVEL 2 FIELD	LAYER 1
01322	65 3 36543	0CD	4, LOWER LEVEL 2 FIELD	LAYER 1
01323	20 3 12044	0CD	4, LOWER LEVEL 2 FIELD	LAYER 1
01324	71 2 34344	0CD	4, LOWER LEVEL 2 FIELD	LAYER 1
01325	71 2 02020	0CD	4, LOWER LEVEL 2 FIELD	LAYER 1
01326	43 6 13045	PCD	4, LOWER LEVEL 2 FIELD	LAYER 1
01327	51 2 00120	SLJ	PRINT	
01328	75 0 01274	SLJ	00	
01329	75 0 00000	SLJ	00	
01330	50 0 00980	SLJ	00	
01331	75 0 01325	SLJ	00	
01332	75 0 01325	SLJ	00	
01333	00 0 03301	00 00	PS2	
01334	00 0 03341	00 00	PS2	
01335	00 0 00047	00 00	29	
01336	00 0 00035	00 00	18	
01337	00 0 00022	00 00	0	
01338	75 4 04371	RTJ	WAE	
01339	00 0 00000	00 00	0	
01340	75 4 04371	RTJ	MAC	
01341	00 0 03302	00 00	PS6.0	
01342	00 0 03341	00 00	PS6.7	
01343	75 0 01374	SLJ	PRINT	
01344	00 0 03341	00 00	PS6.7	

01330	00 3 01500	00 3 00101	00 3 01500	TAU	00 3 01500
01331	00 3 00101	00 3 00101	00 3 00101	0	00 3 00101
01332	00 3 00101	00 3 00101	00 3 00101	DEC 50-1847	00 3 00101
01333	00 3 00101	00 3 00101	00 3 00101	0	00 3 00101
01334	00 3 00101	00 3 00101	00 3 00101	DEC 150-2047	00 3 00101
01335	00 3 00101	00 3 00101	00 3 00101	0	00 3 00101
01336	00 3 00101	00 3 00101	00 3 00101	0	00 3 00101
01337	00 3 00101	00 3 00101	00 3 00101	0	00 3 00101
01338	00 3 00101	00 3 00101	00 3 00101	0	00 3 00101
01339	00 3 00101	00 3 00101	00 3 00101	0	00 3 00101
01340	00 3 00101	00 3 00101	00 3 00101	0	00 3 00101
01341	00 3 00101	00 3 00101	00 3 00101	0	00 3 00101
01342	00 3 00101	00 3 00101	00 3 00101	0	00 3 00101
01343	00 3 00101	00 3 00101	00 3 00101	0	00 3 00101
01344	00 3 00101	00 3 00101	00 3 00101	0	00 3 00101
01345	00 3 00101	00 3 00101	00 3 00101	0	00 3 00101
01346	00 3 00101	00 3 00101	00 3 00101	0	00 3 00101
01347	00 3 00101	00 3 00101	00 3 00101	0	00 3 00101
01348	00 3 00101	00 3 00101	00 3 00101	0	00 3 00101
01349	00 3 00101	00 3 00101	00 3 00101	0	00 3 00101
01350	00 3 00101	00 3 00101	00 3 00101	0	00 3 00101
01351	00 3 00101	00 3 00101	00 3 00101	0	00 3 00101
01352	00 3 00101	00 3 00101	00 3 00101	0	00 3 00101
01353	00 3 00101	00 3 00101	00 3 00101	0	00 3 00101
01354	00 3 00101	00 3 00101	00 3 00101	0	00 3 00101
01355	00 3 00101	00 3 00101	00 3 00101	0	00 3 00101
01356	00 3 00101	00 3 00101	00 3 00101	0	00 3 00101
01357	00 3 00101	00 3 00101	00 3 00101	0	00 3 00101

01360	00 3 00326		00 32		
01361	20 2 56551	TITLE2	ACD	4, VERT GRAD OF VT	LAYER 1
01362	23 2 06751				
01363	61 6 42046	TITLE2	ACD	4, VERT GRAD OF VT	LAYER 1
01364	66 2 02523				
01365	20 2 02020	TITLE2	ACD	4, VERT GRAD OF VT	LAYER 1
01366	20 2 02020				
01367	43 6 13065	TITLE2	BCD	4, VERT GRAD OF VT	LAYER 1
01368	51 2 00120				
01369	75 0 01343		SLJ	PRINT2	
01370	50 0 00000				
01371	75 0 00000	PRINT3	SLJ	..	
01372	50 0 00000				
01373	75 0 01373	+	SLJ	..	
01374	00 0 00300				
01375	00 0 04441				
01376	00 0 63341				
01377	00 0 00047				
01378	00 0 00035				
01379	00 0 00322				
01380	00 0 00310				
01381	75 4 04371	+	RTJ	WAE	
01382	00 0 00000				
01383	75 4 02202	+	RTJ	MAC	
01384	00 0 63341				
01385	75 0 01366		SLJ	PRINT3	
01386	77 7 63341				
01387	00 0 01460		00	TAU	
01388	00 0 00001		00	1	
01389	00 0 00000		00	0	
01390	00 0 00000		00	0	
01391	20 0 00000		DEC	50-1947	
01392	00 0 00000				
01393	00 0 00000		00	0	
01394	01 4 63146		DEC	50-2847	
01395	00 0 00026				
01396	00 0 00026		00	32	
01397	20 4 27145	TITLE4	ACD	4, KINETIC ENERGY	LAYER 1
01398	65 2 37163				
01399	20 6 54565	TITLE4	ACD	4, KINETIC ENERGY	LAYER 1
01400	51 6 73020				
01401	20 2 02020	TITLE4	ACD	4, KINETIC ENERGY	LAYER 1
01402	20 2 02020				
01403	43 6 13065	TITLE4	ACD	4, KINETIC ENERGY	LAYER 1
01404	51 2 00120				

01410	75 0 01364	SLJ	PRINTS
01411	50 0 00300	SLJ	00
01412	75 0 01416	SLJ	004
01413	00 0 03341	00	PS0
01414	00 0 00047	00	PS0
01415	00 0 00033	00	PS0
01416	00 0 00022	00	PS0
01417	75 0 04371	RTJ	MAC
01418	00 0 00000	RTJ	MAC
01419	75 0 03302	RTJ	MAC
01420	75 0 01411	SLJ	PRINTA
01421	00 0 01460	00	PS6,0
01422	00 0 00300	00	PS6,7
01423	00 0 00000	00	TAU
01424	00 0 00300	00	TAU
01425	00 0 00000	00	TAU
01426	00 0 00000	00	TAU
01427	00 0 00000	00	TAU
01428	00 0 00000	00	TAU
01429	00 0 00000	00	TAU
01430	00 0 00000	00	TAU
01431	00 0 00000	00	TAU
01432	00 0 00000	00	TAU
01433	00 0 00000	00	TAU
01434	00 0 00000	00	TAU
01435	00 0 00000	00	TAU
01436	00 0 00000	00	TAU
01437	00 0 00000	00	TAU



01440	64 1 02005	NAME2	UCT	642020J512122J20
01441	12 1 22020	NAME24	UCT	642020J512122J20
01442	64 1 02003	NAME3	UCT	2320200312122J20
01443	12 1 22020	NAME34	UCT	2320200312122J20
01444	64 1 02005	NAME4	UCT	232020J512122J20
01445	12 1 22020	NAME44	UCT	2320200312122J20
01446	17 7 77777	COUNT	UCT	17777777777777
01447	43 6 13065	LEVEL2	UCT	4361306551200220
01450	07 4 47764	A2	UCT	0724776415014743
01451	01 0 30675	D2	UCT	0103067572026573
01452	02 7 34000	C2	UCT	0273400000000000
01453	77 7 77777	D2	UCT	7701577777777777
01454	00 0 00000	E2	UCT	2
01455	01456	LOCAT1	BSS	1
01456	01457	LOCAT2	BSS	1
01457	00 0 00000	TAPUNIT	UCT	50001200
01460	00 0 00000	TAU	DEC	24
01461	12 1 21205	TIME	UCT	1212120512010605
01462	76 0 01003	MATERN	SLS	MMAT
01463	76 0 00762	LAPERR1	SLS	LAPLAC1
01464	50 0 00000	LAPERR2	SLS	LAPLIC2
01465	76 0 00762	READERR	SLS	READJ01
01466	76 0 01113	SDERN	SLS	D/MM
01467	76 0 00750	VORTEN1	SLS	VJRTIS1

0147C	76 3 00755 50 3 00300	WIRTEK2	SLS	WIRTEK2
C1471	76 3 00735 50 3 00000	WIRDEK	SLS	NEWMD
01472	02202	MAA	L1B	MAA
C2202	03707	MAC	L1B	MAC
C3707	04047	MAC	L1B	MAE
04047	04375	SAD	L1B	SAD
04075	04161	SAH	L1R	SAH
04161	04234	SAT	L1H	SAT
04214	04235	SAJ	L1B	SAJ
04235	04312	SAR	L1B	SAR
C4312	04341	VAB	L1B	VAB
04341	04371	WAB	L1B	WAB
04371	04441	WAF	L1B	WAF
04441	14301	FSO	RSS	4000
14301	24141	FS3	RSS	4000
24141	34001	FS2	RSS	4000
34001	43641	FS3	RSS	4000
43641	53501	FS4	RSS	4000
53501	63341	FS5	RSS	4000
63341	74201	FS6	RSS	4000
74201	00000		CND	

# 10. APPENDIX E

PRINTED FIELDS FROM THE CLEAR AIR TURBULENCE FORECAST

COMPUTER PROGRAM FOR OOT 10 MARCH 65 THROUGH 12Z 13 MARCH 65



L	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
LJ021	-014	+014	-032	-080	-003	+027	-002	-005	-034	-021	+029	+025	+020	+033	+011	-008	-003	+019	+057	-001	-085	-014
LJ020	-030	-025	+022	-014	-119	-196	-007	-017	-044	-021	+005	+047	+044	-022	-013	+019	-007	+028	+065	+010	-062	-010
	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	
J019	+014	-002	+051	+047	-038	-025	+032	+039	+047	-001	-011	-004	-028	-042	-016	+001	+016	+035	-003	-011	+053	+035
	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	
J018	+040	+043	-000	+015	+066	+037	-004	+024	+051	+048	+017	-028	-036	-028	-026	-014	+024	+058	-019	-080	+005	+030
	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	
J017	-014	+001	-020	-013	-004	-008	+023	+012	-004	-011	-002	-004	+051	-030	-024	+010	-034	+002	+003	-071	-047	-000
	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	
J016	-028	+014	+014	-024	-024	-008	+078	+015	-072	-047	-000	+004	+040	+061	+016	-054	-056	+006	+020	-005	+014	+003
	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	
J015	+031	+056	+028	-022	-031	+048	+018	-091	-025	+028	+019	+032	+015	-087	+015	+042	+016	+029	+048	+048	+013	
	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	
J014	+025	+040	+021	-015	-051	-008	-008	-008	-008	-008	-008	-008	-008	-008	-008	-008	-008	-008	-008	-008	-008	
	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	
J013	-011	-040	000	+084	+011	-053	027	+136	+000	-158	-044	+079	+015	-000	+019	+036	+038	+033	+004	-010	-022	-050
	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	
J012	+005	+007	-030	-020	+095	-001	-073	-010	+053	+098	+073	-004	+011	+065	+062	-034	-044	+027	+029	-000	-019	-027
	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	
J011	-013	+043	-045	-115	-015	+021	-055	-118	-014	+126	+038	-060	-062	-041	-005	+069	+023	-079	-033	+040	+043	+038
	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	
J010	-083	-035	-005	-005	-005	-005	-005	-005	-005	-005	-005	-005	-005	-005	-005	-005	-005	-005	-005	-005	-005	
	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	
J009	-072	-057	+098	+102	+037	-004	-004	-004	-004	-004	-004	-004	-004	-004	-004	-004	-004	-004	-004	-004	-004	
	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	
J008	+011	-001	+054	-004	-011	-037	-009	-011	+048	+112	-007	-007	-007	-007	-007	-007	-007	-007	-007	-007	-007	
	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	
J007	+008	+010	-037	-088	-027	+054	+021	+000	-002	-053	-021	-023	-082	-015	+056	+033	-008	-038	-019	+004	-003	+004
	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	
J006	-038	+013	-004	-029	+019	+051	-017	-067	+075	-018	-076	+052	-017	-051	+053	+002	-095	-025	+005	+004	+038	+012
	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	
J005	-014	+014	+025	-008	-011	-003	+032	+047	+015	+040	+034	+004	+034	+009	+028	+019	-053	-047	+009	+034	+026	+001
	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	
J004	+004	+019	-001	-036	-037	+006	+047	+041	-014	-027	-016	-024	-024	-024	+026	+035	+037	+007	+008	+025	-008	-013
	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	
J003	-017	-002	+000	-015	-001	+030	-021	-049	+011	-006	-022	-001	-015	+011	+012	-028	-031	+043	+043	+011	+025	+026
	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	
J002	-020	-007	+002	+007	+024	+014	-039	-032	+023	+016	+019	+034	+004	+004	+024	-024	-016	+036	+013	-011	+036	+046
	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	
J001	-016	+009	+011	-009	-008	+009	+016	+013	+011	+007	-019	-009	+031	-025	-088	+002	+045	-003	+017	-008	-068	-054
LJ000	+034	-030	-004	-003	-023	+036	+014	+002	-009	+019	-006	-059	+021	+028	-075	-055	+015	+011	+023	+008	-084	-059
L	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
	LAPLACIAN CF VORTICITY LAYER 1																					
	24 HOURS																					
	00Z 10 MARCH 1965																					

J E





L	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
LJ021	-147	-112	-132	-122	-047	-011	-045	-051	-076	-053	-022	-015	-016	-003	-028	-064	-076	-005	-023	-131	-042	-043
LJ020	-142	-191	-157	-173	-233	-191	-136	-113	-124	-075	-148	-013	-013	-049	-029	-014	-044	-027	+042	-023	-002	-043
J019	-115	-152	-111	-146	-030	-176	-133	-067	-041	-07	-100	-097	-05	-69	-036	-055	-091	-008	-030	-037	+021	+006
J018	-009	-028	-091	-097	-097	-097	-097	-097	-097	-097	-097	-097	-097	-097	-097	-097	-097	-097	-097	-097	-097	-097
J017	-029	-032	-048	-055	-040	-056	-017	-043	-030	-030	-030	-030	-030	-030	-030	-030	-030	-030	-030	-030	-030	-030
J016	-049	-045	-006	+009	-044	-011	-015	-129	-122	-107	-053	-05	-029	+00	-018	-013	-081	-030	-013	-007	-011	-011
J015	+014	+39	+016	+044	-066	-022	-112	-216	-175	-025	+038	-013	-061	-023	-04	-164	-134	-047	-033	+006	+041	+001
J014	-022	-016	-021	-054	-016	-074	-076	-097	-097	-097	-097	-097	-097	-097	-097	-097	-097	-097	-097	-097	-097	-097
J013	-111	-156	-110	-023	-023	-023	-023	-023	-023	-023	-023	-023	-023	-023	-023	-023	-023	-023	-023	-023	-023	-023
J012	-031	-108	-157	-084	+037	-108	-108	-108	-108	-108	-108	-108	-108	-108	-108	-108	-108	-108	-108	-108	-108	-108
J011	-069	-007	-146	-146	-146	-146	-146	-146	-146	-146	-146	-146	-146	-146	-146	-146	-146	-146	-146	-146	-146	-146
J010	-177	-094	-133	-094	-094	-094	-094	-094	-094	-094	-094	-094	-094	-094	-094	-094	-094	-094	-094	-094	-094	-094
J009	-273	-226	-070	-003	-055	-054	-164	-01	-128	-01	-128	-01	-128	-01	-128	-01	-128	-01	-128	-01	-128	-01
J008	-203	-169	-079	-053	-053	-053	-053	-053	-053	-053	-053	-053	-053	-053	-053	-053	-053	-053	-053	-053	-053	-053
J007	-149	-148	-166	-178	-141	-124	-109	-149	-153	-213	-106	-207	-267	-183	-110	-000	-000	-000	-000	-000	-000	-000
J006	-152	-133	-122	-130	-130	-130	-130	-130	-130	-130	-130	-130	-130	-130	-130	-130	-130	-130	-130	-130	-130	-130
J005	-102	-04	-098	-065	-069	-06	-169	-126	-145	-160	-226	-233	-247	-2	-6	-146	-164	-250	-266	-237	-153	-097
J004	-044	-017	-075	-122	-117	-055	-014	-058	-126	-161	-169	-132	-212	-013	-134	-128	-128	-252	-108	-100	-104	-088
J003	-064	-025	-094	-132	-126	-026	-084	-054	-054	-054	-054	-054	-054	-054	-054	-054	-054	-054	-054	-054	-054	-054
J002	-044	-059	-076	-068	-051	-093	-111	-101	-018	-023	-033	-036	-082	-082	-082	-082	-082	-082	-082	-082	-082	-082
J001	-042	-032	-019	-060	-076	-06	-71	-052	-033	-03	-036	-070	-057	-130	-179	-106	-075	-103	-065	-083	-149	-135
LJ000	-001	-070	-049	-051	-055	-05	-037	-041	-057	-08	-042	-097	-022	-55	-195	-176	-087	-072	-040	-055	-134	-127
L	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021

PREC KAT FIELD

LAYER 1

FR 5.

24 HOURS

00Z 10 MARCH 1965





L	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
LJ021	-144	-001	-007	-077	-066	-004	-042	-016	-019	-031	-037	-038	-024	-012	-030	-019	-011	-015	-002	-024	-093	-030
LJ020	-117	-036	-069	-055	-166	-04	-06	-003	-054	-047	-023	-050	-021	-18	-006	-006	-005	-041	-073	-021	-077	-009
J019	+026	+005	+007	+040	-047	+034	+110	+021	+014	+003	-019	-012	-012	-012	-012	-012	-012	-012	-012	-012	-012	-012
J018	+078	+016	+065	+048	+028	+017	+030	+016	+008	-034	-035	-049	-028	-017	-034	-034	-034	-034	-034	-034	-034	-034
J017	-062	-010	-039	-004	-009	-043	-023	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001
J016	-076	-002	+041	-005	-014	+037	+053	-033	-055	-043	-011	-003	+044	+077	-015	-077	-079	-011	+012	-000	-000	-000
J015	+050	+083	+007	-061	-061	-061	+075	+032	-099	-027	+029	+020	+033	+003	-011	-061	-012	+027	-007	+033	+061	+027
J014	+061	+047	+023	-001	-069	-008	+031	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001
J013	-012	-050	-001	+009	+009	-011	-027	+030	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001
J012	-014	-001	-044	-007	+094	+015	-007	-033	-033	-137	-025	+148	-048	-067	-064	-001	+068	-019	-042	-033	+070	+065
J011	-034	+045	-034	-134	-061	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001
J010	-130	-056	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001
J009	-098	-001	+126	+140	+001	+001	+001	+001	+001	+001	+001	+001	+001	+001	+001	+001	+001	+001	+001	+001	+001	+001
J008	+044	+001	+033	+062	+001	+001	+001	+001	+001	+001	+001	+001	+001	+001	+001	+001	+001	+001	+001	+001	+001	+001
J007	+038	+043	-004	-124	-017	-016	-016	-016	-016	-016	-016	-016	-016	-016	-016	-016	-016	-016	-016	-016	-016	-016
J006	-041	+044	+010	-077	+031	+133	-021	-021	-021	-021	-021	-021	-021	-021	-021	-021	-021	-021	-021	-021	-021	-021
J005	-014	+022	+048	+019	+003	+009	+009	+009	+009	+009	+009	+009	+009	+009	+009	+009	+009	+009	+009	+009	+009	+009
J004	+010	+014	-006	-045	-047	+015	+015	+015	+015	+015	+015	+015	+015	+015	+015	+015	+015	+015	+015	+015	+015	+015
J003	-014	-003	+003	+030	+031	-004	-037	-037	-037	-037	-037	-037	-037	-037	-037	-037	-037	-037	-037	-037	-037	-037
J002	-019	-013	+003	+030	+031	-004	-037	-037	-037	-037	-037	-037	-037	-037	-037	-037	-037	-037	-037	-037	-037	-037
J001	+021	+004	+006	-012	-015	+114	+020	+009	+010	+012	+012	+012	+012	+012	+012	+012	+012	+012	+012	+012	+012	+012
LJ000	+017	-016	-002	-002	-020	+013	+020	+006	-005	+17	-023	-050	+024	+024	-058	-057	-013	+034	+011	-034	-037	-037
L	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
M																						

002 10 MARCH 1965

24 HOURS

LAPLACIAN OF VELOCITY LAYER 2



L	1030	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
LJ021	+131	+115	+135	+137	+119	+135	+157	+159	+146	+136	+146	+158	+139	+13	+102	+118	+105	+187	+154	+11	+10	+24
LJ020	+202	+184	+185	+136	+118	+114	+116	+187	+146	+147	+140	+159	+167	+17	+102	+123	+147	+140	+113	+107	+113	+24
	222222222222	222222222222	222222222222	222222222222	222222222222	222222222222	222222222222	222222222222	222222222222	222222222222	222222222222	222222222222	222222222222	222222222222	222222222222	222222222222	222222222222	222222222222	222222222222	222222222222	222222222222	222222222222
J019	+137	+148	+142	+167	+173	+152	+185	+160	+169	+181	+194	+171	+114	+107	+134	+139	+126	+118	+118	+118	+118	+115
J018	+131	+152	+171	+163	+177	+162	+171	+177	+175	+159	+106	+107	+124	+101	+127	+149	+135	+117	+116	+116	+116	+116
J017	+112	+120	+122	+114	+107	+113	+114	+105	+104	+103	+107	+103	+104	+111	+104	+104	+106	+102	+105	+101	+101	+101
J016	+112	+111	+115	+112	+113	+114	+115	+116	+117	+118	+119	+120	+121	+122	+123	+124	+125	+126	+127	+128	+129	+130
J015	+100	+102	+112	+117	+117	+117	+117	+117	+117	+117	+117	+117	+117	+117	+117	+117	+117	+117	+117	+117	+117	+117
J014	+103	+106	+107	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104
J013	+102	+103	+107	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104
J012	+100	+100	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104	+104
J011	+108	+105	+102	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101
J010	+109	+166	+109	+107	+109	+107	+107	+107	+107	+107	+107	+107	+107	+107	+107	+107	+107	+107	+107	+107	+107	+107
J009	+148	+153	+127	+117	+117	+117	+117	+117	+117	+117	+117	+117	+117	+117	+117	+117	+117	+117	+117	+117	+117	+117
J008	+222	+181	+108	+106	+106	+106	+106	+106	+106	+106	+106	+106	+106	+106	+106	+106	+106	+106	+106	+106	+106	+106
J007	+121	+128	+109	+109	+107	+114	+145	+145	+145	+145	+145	+145	+145	+145	+145	+145	+145	+145	+145	+145	+145	+145
J006	+106	+108	+108	+107	+106	+106	+106	+106	+106	+106	+106	+106	+106	+106	+106	+106	+106	+106	+106	+106	+106	+106
J005	+103	+103	+103	+103	+103	+103	+103	+103	+103	+103	+103	+103	+103	+103	+103	+103	+103	+103	+103	+103	+103	+103
J004	+112	+115	+122	+128	+126	+127	+127	+127	+127	+127	+127	+127	+127	+127	+127	+127	+127	+127	+127	+127	+127	+127
J003	+104	+105	+109	+116	+112	+112	+112	+112	+112	+112	+112	+112	+112	+112	+112	+112	+112	+112	+112	+112	+112	+112
J002	+102	+103	+104	+105	+108	+115	+123	+126	+128	+131	+135	+142	+142	+142	+142	+142	+142	+142	+142	+142	+142	+142
J001	+102	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101
LJ000	+104	+103	+102	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101	+101
L	1009	1001	1002	1004	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
P	KINATIC ENERGY	LAYER 2	PRG.	24 HOURS	00Z 10 MARCH 1965																	







J021	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
J020	-025	-022	-006	-018	-017	-026	-022	-009	-017	-013	-007	-002	-040	-029	-025	-015	-060	-035	-045	-024	-036	-000
	-050	-036	+015	-021	-006	-061	-015	-044	-024	-000	+017	+081	+063	+010	+033	+020	+084	+008	+055	+039	+002	-077
	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888
J019	+023	+007	+005	+023	+007	+005	-006	-037	-052	-022	+005	+005	+022	+016	+016	+047	+027	+012	+011	+029	+007	+001
	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888
J018	+029	+045	-012	-021	-000	-002	-011	-025	-043	+039	+009	+063	+030	+005	+007	+006	+075	+041	+006	+020	+011	+048
	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888
J017	-016	+029	+015	-025	-023	+024	+040	+000	+010	+016	+023	+047	+013	+043	+005	+029	+011	+030	+051	+001	+004	-034
	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888
J016	-005	+011	+028	+038	+000	-009	+009	+017	+045	+04	+10	+057	+002	+049	+000	+018	+055	+039	+036	+006	+020	-020
	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888
J015	-007	+007	+017	+006	+019	+021	-020	+012	+045	+023	-017	+026	+034	+021	+022	+074	+057	+071	+098	+030	+015	-036
	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888
J014	+020	+010	-002	-021	+000	+007	+000	+055	+006	+018	+028	+012	+024	+005	+016	+038	+032	+029	+031	+008	-006	
	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888
J013	+046	+011	-021	+033	+027	-063	-040	+017	-037	-013	+047	+129	+080	+045	+03	+041	+041	+013	+027	+036	-068	-045
	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888
J012	-094	-02	+075	+051	+039	+039	+039	+026	+017	+013	+002	+065	+013	+083	+007	+040	-001	+028	+043	+036	-004	
	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888
J011	-160	-027	+037	-046	-051	+053	+051	+004	+008	+079	+045	+056	+063	+004	+013	+072	+041	+058	+067	+074	-019	
	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888
J010	-037	+006	-14	-111	+078	+016	-054	-041	-077	+010	+071	-031	-045	+048	+022	+044	+043	+104	+02	+353	-017	
	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888
J009	-007	-041	+004	+071	+081	-052	-032	+039	-023	+02	+030	+36	+056	+04	+013	+055	+051	+053	+025	+064	-017	+052
	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888
J008	-020	+016	+098	-030	+010	+010	+015	+045	+058	+021	-015	-100	-067	+04	+000	-021	+011	+034	+02	+007	-002	
	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888
J007	+015	+021	-030	-069	-026	-013	-030	+050	-016	+003	+080	-090	-04	+069	+0	+017	+0	+034	+033	+013	-054	
	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888
J006	-002	+002	+000	+000	+000	+000	+000	+043	-025	-072	+045	+11	+002	+080	+007	+014	-078	+058	+018	+002	+031	+015
	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888
J005	-010	+004	+023	+033	+028	+046	+007	+035	+051	-008	-063	+046	+000	+031	+019	+025	-065	-052	+002	+021	+025	+016
	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888
J004	-008	+017	+04	-030	-015	+012	-060	-058	+031	+08	-025	-048	+016	+043	+017	+038	+051	+009	+000	+016	-007	-010
	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888
J003	-016	+012	+024	-007	-029	-011	+014	+015	-007	+005	+042	+027	+015	+015	+004	+010	+019	+028	+020	-004	-001	+066
	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888
J002	+004	+005	-022	-010	-013	+018	+025	+027	+010	-034	-014	+032	+011	+004	+009	-023	-046	-005	+015	+013	+004	+002
	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888
J001	-006	+003	-005	-005	+010	+017	-016	-003	+009	-043	-017	-019	-016	-004	-003	+008	+011	-009	-025	-026	+011	+039
J000	+033	-040	-009	-021	-013	-028	-006	+011	-004	+010	+034	-002	-043	-007	+013	+013	+016	+031	+004	-068	+043	+046
	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021

122 IN MARCH 1965

24 HOURS

LAPLACIAN OF VORTICITY LAYER 1

J021 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 +027 -021 -013 -026 -018 -003 -004 -004 -015 -020 -014 -027 -029 -010 -011 -022 -022 -011 -015 -016 -004 -005  
 +043 -030 -020 -021 -020 -022 -009 -004 -015 -020 -014 -027 -029 -010 -011 -022 -022 -011 -015 -016 -004 -005  
 J020 111  
 J019 -038 -035 -020 -011 -013 -016 -027 -025 -022 -013 -036 -033 -010 -014 -015 -027 -029 -027 -019 -002 -006 -012  
 J018 -011 -027 -023 -045 -019 -026 -028 -033 -028 -011 -041 -035 -028 -015 -010 -030 -029 -035 -024 -007 -011 -021  
 J017 -006 -029 -029 -031 -030 -025 -018 -017 -020 -033 -037 -036 -025 -011 -004 -017 -023 -029 -021 -019 -014 -014  
 J016 -018 -020 -020 -037 -037 -019 -009 -014 -042 -042 -030 -036 -014 -014 -015 -022 -024 -028 -030 -020 -013 -012  
 J015 -021 -014 -012 -004 -017 -029 -030 -050 -057 -046 -013 -022 -040 -031 -026 -029 -028 -032 -016 -016 -008 -004  
 J014 -017 -021 -020 -031 -034 -047 -046 -046 -043 -016 -010 -013 -027 -029 -031 -014 -026 -026 -023 -022 -007 -007  
 J013 -053 -059 -042 -020 -032 -040 -031 -021 -039 -022 -027 -017 -018 -003 -014 -022 -017 -026 -026 -017 -013 -019  
 J012 -053 -066 -070 -041 -027 -032 -008 -008 -029 -035 -021 -019 -027 -015 -026 -017 -017 -029 -029 -030 -031 -023  
 J011 -043 -041 -046 -042 -048 -023 -012 -003 -011 -011 -023 -03 -017 -02 -02 -027 -034 -040 -027 -026 -022  
 J010 -046 -031 -032 -033 -012 -021 -016 -009 -003 -006 -024 -040 -014 -025 -020 -017 -036 -044 -050 -057 -030 -000  
 J009 -071 -070 -074 -071 -057 -041 -014 -014 -007 -005 -023 -031 -021 -036 -019 -017 -00 -032 -041 -041 -039 -019  
 J008 -100 -067 -066 -065 -074 -086 -085 -058 -029 -014 -014 -048 -042 -045 -019 -027 -037 -049 -043 -044 -041 -033  
 J007 -104 -109 -094 -057 -052 -086 -093 -081 -077 -050 -011 -011 -011 -011 -011 -011 -011 -011 -011 -011 -011 -011  
 J006 -083 -103 -083 -046 -053 -070 -070 -074 -081 -097 -082 -033 -047 -043 -036 -047 -054 -057 -062 -054 -049 -052  
 J005 -057 -069 -075 -040 -054 -035 -031 -064 -054 -074 -013 -020 -008 -006 -071 -073 -021 -040 -060 -058 -042 -051  
 J004 -040 -021 -056 -055 -010 -012 -021 -049 -037 -026 -054 -035 -013 -014 -008 -078 -082 -083 -076 -055 -056 -049  
 J003 -031 -011 -037 -059 -058 -012 -022 -036 -038 -018 -011 -032 -061 -087 -086 -074 -075 -089 -087 -081 -079 -062  
 J002 -025 -025 -024 -045 -089 -086 -059 -052 -042 -024 -014 -027 -026 -034 -065 -080 -062 -067 -067 -067 -067 -064  
 J001 -086 -019 -016 -040 -032 -047 -077 -077 -077 -077 -077 -077 -077 -077 -077 -077 -077 -077 -077 -077 -077 -077  
 J000 -020 -026 -013 -017 -022 -020 -031 -068 -071 -077 -074 -080 -069 -069 -069 -069 -069 -069 -069 -069 -069 -069  
 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 VERY GRAD OF VT LAYER 1 24 HOURS 12Z 10 MARCH 1965



12Z 10 MARCH 1965

24 HOURS

2405.

KINETIC ENERGY

J021 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 J020 -130 -110 -097 -093 -094 -043 -020 -023 -014 -027 -055 -058 -002 -008 -037 -029 -002 -002 -013 -003 -051 -017  
 -173 -152 -082 -106 -081 -006 -071 -076 -005 -032 -009 -038 -006 -022 -056 -033 -022 -051 -088 -014 -016 -094  
 J019 -071 -104 -082 -042 -052 -067 -09 -111 -097 -050 -027 -100 -041 -040 -102 -115 -059 -053 -054 -014 -024  
 J018 -008 -019 -075 -068 -047 -063 -072 -110 -111 -001 -065 -160 -13 -048 -020 -057 -095 -04 -010 -048 -040 -016  
 J017 -037 -001 -08 -075 -064 -013 -003 -034 -042 -049 -062 -100 -09 -014 -007 -009 -101 -111 -041 -022 -057  
 J016 -031 -016 -002 -000 -034 -040 -021 -027 -040 -091 -086 -100 -107 -029 -051 -126 -146 -132 -059 -080 -035  
 J015 -037 -024 -013 -017 -025 -038 -001 -100 -065 -095 -064 -073 -15 -052 -039 -151 -189 -083 -323 -003 -005 -030  
 J014 -025 -048 -076 -095 -078 -105 -19 -068 -146 -177 -060 -021 -043 -026 -058 -110 -065 -037 -004 -018 -015 -021  
 J013 -051 -123 -222 -018 -05 -155 -103 -042 -127 -184 -079 -112 -042 -059 -066 -021 -007 -051 -058 -056 -004 -104  
 J012 -215 -159 -041 -026 -083 -051 -017 -080 -039 -058 -030 -040 -037 -099 -047 -002 -09 -010 -004 -054 -117 -199  
 J011 -235 -067 -014 -131 -083 -021 -017 -026 -021 -035 -008 -105 -092 -019 -027 -095 -008 -083 -10 -018 -021 -117  
 J010 -183 -039 -210 -14 -025 -040 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -106  
 J009 -233 -236 -196 -099 -028 -06 -134 -148 -10 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -060  
 J008 -246 -234 -04 -085 -000 -123 -146 -119 -000 -114 -181 -288 -221 -120 -000 -131 -100 -008 -127 -171 -163 -114  
 J007 -163 -158 -182 -170 -118 -172 -181 -108 -195 -174 -137 -364 -298 -132 -152 -133 -100 -180 -224 -168 -148 -169  
 J006 -120 -143 -112 -092 -081 -004 -114 -085 -193 -284 -186 -172 -297 -325 -212 -192 -261 -256 -249 -264 -117 -089  
 J005 -083 -085 -072 -057 -022 -011 -083 -113 -004 -183 -290 -209 -039 -313 -238 -232 -322 -300 -231 -134 -004 -068  
 J004 -055 -013 -061 -115 -035 -013 -100 -132 -041 -041 -158 -237 -217 -189 -194 -173 -180 -217 -179 -189 -098 -074  
 J003 -050 -003 -018 -071 -096 -062 -024 -040 -062 -037 -012 -051 -124 -195 -141 -128 -125 -129 -118 -118 -095 -061  
 J002 -023 -021 -049 -095 -082 -073 -040 -031 -039 -072 -045 -011 -834 -060 -083 -133 -169 -139 -125 -113 -087 -065  
 J001 -013 -015 -022 -047 -023 -031 -094 -081 -056 -076 -068 -037 -057 -079 -096 -115 -127 -153 -129 -078 -047  
 J000 -013 -066 -023 -004 -036 -050 -027 -057 -075 -062 -044 -086 -154 -130 -098 -082 -073 -062 -058 -121 -031 -078  
 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 PROG KAI FIELD - LAYER 1 24 HOURS 12Z 10 MARCH 1965



J021 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 J020 -069 -011 -006 -033 -004 -054 -002 -030 -006 -011 -006 -012 -055 -002 -066 -016 -065 -031 -068 -044 -059 -029  
 -081 -043 -085 -015 -082 -045 -012 -039 -044 -024 -005 -071 -073 -006 -036 -036 -040 -040 -062 -054 -002 -090  
 J019 -044 -030 -052 -078 -019 -001 -022 -055 -048 -012 -018 -015 -036 -019 -037 -054 -008 -007 -035 -014 -092  
 J018 -052 -054 -043 -040 -022 -025 -007 -049 -060 -042 -020 -064 -049 -002 -061 -043 -053 -061 -055 -035 -017 -047  
 J017 -030 -066 -002 -042 -050 -032 -034 -000 -017 -013 -012 -062 -020 -044 -013 -027 -001 -008 -036 -009 -005 -032  
 J016 -032 -003 -045 -034 -003 -004 -009 -018 -063 -006 -006 -013 -080 -002 -081 -006 -005 -083 -053 -013 -008 -002 -028  
 J015 -006 -005 -028 -037 -045 -014 -013 -040 -011 -018 -041 -043 -020 -025 -060 -063 -036 -036 -036 -036 -010 -010 -036  
 J014 -073 -043 -010 -030 -017 -020 -04 -021 -069 -033 -001 -039 -053 -008 -008 -056 -032 -008 -034 -016 -005  
 J013 -088 -015 -060 -031 -011 -060 -032 -047 -113 -024 -123 -07 -060 -046 -052 -043 -014 -035 -057 -036 -088  
 J012 -170 -071 -117 -061 -026 -009 -000 -011 -011 -016 -071 -016 -083 -005 -041 -008 -013 -066 -013 -076 -089  
 J011 -297 -036 -130 -072 -099 -047 -053 -088 -088 -088 -088 -088 -088 -088 -088 -088 -088 -088 -088 -088 -088 -088  
 J010 -085 -014 -117 -151 -040 -031 -061 -084 -021 -036 -000 -017 -028 -011 -032 -003 -004 -044 -117 -06 -115 -015  
 J009 -027 -055 -040 -000 -146 -044 -045 -004 -010 -037 -019 -024 -018 -006 -040 -010 -031 -015 -102 -053 -008  
 J008 -005 -063 -082 -109 -025 -007 -043 -091 -067 -002 -058 -127 -006 -061 -050 -044 -028 -049 -015 -009 -004 -007  
 J007 -012 -057 -019 -136 -099 -053 -000 -022 -04 -047 -032 -093 -045 -014 -003 -004 -026 -039 -036 -036 -026  
 J006 -002 -025 -005 -041 -006 -053 -013 -016 -048 -028 -094 -111 -055 -106 -016 -028 -000 -091 -016 -008 -018 -015  
 J005 -005 -003 -036 -050 -065 -077 -007 -003 -007 -031 -000 -050 -080 -000 -034 -004 -068 -086 -015 -035 -003 -017  
 J004 -009 -010 -020 -051 -080 -000 -011 -027 -005 -010 -027 -056 -027 -046 -022 -048 -078 -036 -016 -014 -019 -010  
 J003 -013 -005 -036 -075 -070 -042 -020 -004 -020 -022 -063 -003 -008 -008 -000 -004 -013 -042 -041 -009 -019 -003  
 J002 -004 -005 -023 -017 -043 -015 -002 -019 -020 -024 -000 -023 -025 -015 -009 -036 -106 -04 -027 -002 -002 -012  
 J001 -004 -006 -010 -013 -018 -029 -010 -008 -005 -044 -029 -050 -053 -007 -010 -001 -022 -029 -042 -060 -015 -051  
 J000 -018 -030 -005 -015 -018 -020 -006 -007 -002 -011 -033 -007 -057 -016 -003 -008 -037 -050 -001 -074 -027 -058  
 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 LAPLACIAN OF VORTICITY, LAYER 2  
 P-06.  
 24 HOURS  
 12Z 16 MARCH 1965



J001	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	014	1015	1016	1017	1018	1019	1020	1021
J002	034	034	010	013	026	046	032	004	017	032	009	014	012	014	016	025	009	005	014	014	007	003
J003	052	060	036	026	019	073	044	019	004	013	021	021	014	004	013	019	009	010	010	010	011	009
J004	031	053	062	046	023	036	050	034	000	027	009	020	027	022	018	021	021	012	008	021	023	007
J005	007	018	031	034	038	048	049	043	040	043	03	017	010	016	012	016	021	018	010	016	026	023
J006	007	002	003	008	038	032	039	028	024	022	02	021	020	016	005	008	012	012	014	016	021	030
J007	017	012	006	003	003	011	016	009	000	035	01	014	010	003	015	015	007	020	022	011	004	015
J008	030	027	013	004	014	031	000	000	034	050	030	010	020	019	022	021	035	031	026	019	012	022
J009	036	038	032	015	031	045	039	042	048	033	010	022	011	007	002	032	043	021	003	018	017	032
J010	041	041	042	046	061	051	033	032	022	012	023	019	023	012	019	042	029	005	002	022	039	052
J011	018	028	030	027	050	018	018	017	013	028	014	004	017	019	019	027	03	013	006	021	044	037
J012	041	028	026	028	036	038	038	032	007	015	009	016	023	009	031	040	018	017	044	046	027	033
J013	072	061	061	074	080	079	064	057	030	020	006	023	028	014	021	050	036	026	041	044	009	034
J014	068	061	060	068	063	059	066	071	080	048	016	015	017	03	015	065	051	019	021	036	026	014
J015	057	052	030	011	015	011	012	040	076	000	074	021	021	047	042	058	044	020	020	021	017	007
J016	043	044	045	032	015	004	008	023	016	043	108	098	064	037	065	045	035	034	030	024	023	027
J017	023	027	044	039	025	026	026	002	007	043	044	087	082	072	073	060	044	040	031	035	040	034
J018	007	039	027	030	012	011	010	002	021	028	011	023	041	00	057	057	047	031	029	037	030	016
J019	006	013	023	026	011	004	000	033	031	031	30	014	016	016	016	016	016	016	016	016	016	016
J020	007	006	019	023	020	019	030	040	010	015	015	019	015	013	007	006	011	019	019	022	022	007
J021	006	013	012	012	015	018	022	013	000	022	005	002	011	011	012	009	012	007	016	034	031	028
J022	014	009	004	005																		

[illegible]

KINETIC ENERGY

24 401195

1937 10 MARCH 1948







[illegible]

L 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 L J021 +024 +028 +030 +031 +036 +037 +034 +027 +017 +020 +016 +019 +017 +009 +013 +019 +020 +040 +032 +019 +009 +007  
 L J020 +029 +042 +043 +028 +023 +021 +029 +013 +002 +015 +026 +017 +016 +018 +027 +032 +034 +042 +018 +004  
 111111111  
 J019 +019 +015 +018 +016 +015 +14 +017 +008 +014 +008 +012 +017 +028 +024 +012 +014 +014 +042 +049 +016 +004  
 J018 +012 +014 +020 +020 +017 +008 +022 +016 +007 +011 +019 +029 +023 +014 +017 +013 +020 +056 +047 +007 +012  
 J017 +016 +026 +023 +020 +077 +046 +054 +017 +015 +009 +016 +024 +029 +020 +010 +022 +016 +034 +047 +030 +015 +005  
 111111111  
 J016 +026 +025 +067 +004 +009 +045 +058 +037 +028 +007 +020 +026 +031 +023 +011 +021 +032 +039 +025 +014 +014 +010  
 111111111  
 J015 +019 +004 +014 +015 +017 +015 +049 +038 +026 +025 +019 +018 +025 +025 +032 +032 +031 +021 +008 +012 +016  
 111111111  
 J014 +019 +005  
 111111111  
 J013 +048 +044 +044 +044 +042 +041 +060 +068 +037 +028 +012 +012 +020 +018 +022 +020 +017 +029 +034 +024 +019  
 111111111  
 J012 +053 +046 +049 +051 +051 +051 +051 +051 +051 +051 +051 +051 +051 +051 +051 +051 +051 +051 +051 +051 +051 +051  
 111111111  
 J011 +048 +035 +030 +007 +013 +008 +017 +040 +041 +043 +040 +024 +014 +006 +008 +011 +017 +030 +031 +026 +031 +018  
 111111111  
 J010 +046 +017 +029 +040 +000 +000 +012 +041 +045 +021 +025 +049 +037 +023 +017 +028 +028 +022 +016 +016 +016  
 111111111  
 J009 +071 +053 +071 +043 +045 +036 +029 +027 +044 +026 +050 +040 +046 +044 +018 +038 +018 +021 +026 +024 +024 +028  
 222222222  
 J008 +109 +101 +079 +042 +063 +039 +068 +038 +049 +060 +017 +064 +008 +047 +043 +049 +048 +041 +046 +042 +035 +039  
 222222222  
 J007 +094 +089 +062 +056 +124 +172 +124 +077 +065 +080 +094 +053 +027 +030 +056 +072 +061 +056 +055 +043 +042 +035  
 222222222  
 J006 +085 +068 +061 +074 +133 +073 +117 +085 +083 +084 +092 +123 +088 +058 +083 +086 +060 +051 +044 +045 +058 +071  
 222222222  
 J005 +104 +072 +058 +040 +083 +087 +080 +073 +063 +073 +078 +096 +111 +106 +113 +097 +072 +056 +059 +072 +069 +055  
 222222222  
 J004 +085 +077 +055 +045 +026 +068 +073 +057 +042 +033 +042 +044 +074 +097 +092 +090 +091 +075 +080 +080 +062 +041  
 222222222  
 J003 +051 +075 +074 +056 +043 +018 +025 +032 +049 +035 +027 +024 +031 +019 +069 +059 +070 +077 +063 +057 +069 +076  
 222222222  
 J002 +030 +052 +072 +074 +063 +048 +042 +022 +042 +048 +046 +035 +032 +055 +062 +046 +048 +063 +058 +047 +086 +098  
 111111111  
 J001 +001 +009 +028 +041 +050 +072 +036 +022 +044 +049 +052 +054 +043 +046 +053 +053 +047 +053 +061 +087 +090 +060  
 L J000 +033 +025 +017 +014 +043 +043 +027 +027 +041 +044 +056 +068 +058 +060 +076 +071 +058 +043 +050 +080 +044 +061  
 L 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 VERT GRAU CF VT LAYER 1 PRG. 24 HOURS 00Z 11 MARCH 1965



1005	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017
PRCG	KAT	FIELD															
			LAYER 1					PRUG.									
									24	HOURS							
													01	Z	11	MARCH	1965

L	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
LJ021	+895	+895	+895	+895	+895	+895	+895	+895	+895	+895	+895	+895	+895	+895	+895	+895	+895	+895	+895	+895	+895	
LJ020	+911	+911	+911	+911	+911	+911	+911	+911	+911	+911	+911	+911	+911	+911	+911	+911	+911	+911	+911	+911	+911	
J019	+923	+923	+923	+923	+923	+923	+923	+923	+923	+923	+923	+923	+923	+923	+923	+923	+923	+923	+923	+923	+923	
J018	+929	+929	+929	+929	+929	+929	+929	+929	+929	+929	+929	+929	+929	+929	+929	+929	+929	+929	+929	+929	+929	
J017	+934	+934	+934	+934	+934	+934	+934	+934	+934	+934	+934	+934	+934	+934	+934	+934	+934	+934	+934	+934	+934	
J016	+938	+938	+938	+938	+938	+938	+938	+938	+938	+938	+938	+938	+938	+938	+938	+938	+938	+938	+938	+938	+938	
J015	+940	+940	+940	+940	+940	+940	+940	+940	+940	+940	+940	+940	+940	+940	+940	+940	+940	+940	+940	+940	+940	
J014	+937	+937	+937	+937	+937	+937	+937	+937	+937	+937	+937	+937	+937	+937	+937	+937	+937	+937	+937	+937	+937	
J013	+928	+928	+928	+928	+928	+928	+928	+928	+928	+928	+928	+928	+928	+928	+928	+928	+928	+928	+928	+928	+928	
J012	+919	+919	+919	+919	+919	+919	+919	+919	+919	+919	+919	+919	+919	+919	+919	+919	+919	+919	+919	+919	+919	
J011	+913	+913	+913	+913	+913	+913	+913	+913	+913	+913	+913	+913	+913	+913	+913	+913	+913	+913	+913	+913	+913	
J010	+915	+915	+915	+915	+915	+915	+915	+915	+915	+915	+915	+915	+915	+915	+915	+915	+915	+915	+915	+915	+915	
J009	+925	+925	+925	+925	+925	+925	+925	+925	+925	+925	+925	+925	+925	+925	+925	+925	+925	+925	+925	+925	+925	
J008	+937	+937	+937	+937	+937	+937	+937	+937	+937	+937	+937	+937	+937	+937	+937	+937	+937	+937	+937	+937	+937	
J007	+947	+947	+947	+947	+947	+947	+947	+947	+947	+947	+947	+947	+947	+947	+947	+947	+947	+947	+947	+947	+947	
J006	+953	+953	+953	+953	+953	+953	+953	+953	+953	+953	+953	+953	+953	+953	+953	+953	+953	+953	+953	+953	+953	
J005	+956	+956	+956	+956	+956	+956	+956	+956	+956	+956	+956	+956	+956	+956	+956	+956	+956	+956	+956	+956	+956	
J004	+961	+961	+961	+961	+961	+961	+961	+961	+961	+961	+961	+961	+961	+961	+961	+961	+961	+961	+961	+961	+961	
J003	+963	+963	+963	+963	+963	+963	+963	+963	+963	+963	+963	+963	+963	+963	+963	+963	+963	+963	+963	+963	+963	
J002	+965	+965	+965	+965	+965	+965	+965	+965	+965	+965	+965	+965	+965	+965	+965	+965	+965	+965	+965	+965	+965	
J001	+965	+966	+966	+966	+966	+966	+966	+966	+966	+966	+966	+966	+966	+966	+966	+966	+966	+966	+966	+966	+966	
LJ000	+965	+966	+966	+966	+966	+966	+966	+966	+966	+966	+966	+966	+966	+966	+966	+966	+966	+966	+966	+966	+966	
L	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021

LOWER LEVEL 2 FIELD LAYER 2 24 HOURS 00Z 11 MARCH 1965



L 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 LJ021 -015 +008 -054 -023 +032 +010 -019 -056 -031 +008 +029 +017 +021 -015 -026 +056 +037 -043 +047 +077 -080 -089  
 LJ020 +035 -025 +025 -037 -036 +012 +039 +032 +013 +035 +017 +044 +045 -038 +039 +030 -030 -095 +001 +023 -003  
 J019 +033 +027 +024 -004 -070 +005 +040 +012 +040 +003 -047 +016 +070 -018 -000 +011 -035 -004 +014 -046 +051 +102  
 J018 -058 -027 +033 +018 -021 +041 +050 -033 -003 +003 -047 +016 +070 -018 -000 +011 -035 -004 +014 -046 +051 +102  
 J017 -072 +002 +050 +032 +016 +029 +032 -060 -106 +014 +017 +015 -026 -052 -024 +036 +011 -069 -041 +043 +026 -048  
 J016 +000 +041 +008 +031 +008 -021 -014 -059 +007 +051 +008 +031 +035 -024 -067 -042 -049 +051 -031 -022 +038  
 J015 +031 +049 +009 -055 -052 -021 +009 +026 +051 +007 -036 -014 +027 +006 -026 -128 -18 +120 +068 -059 -043 +030  
 J014 +044 +027 +027 -014 -042 +032 +065 +025 +050 +005 -023 +045 +008 +031 +035 -024 -067 -042 -049 +051 -031 -022 +038  
 J013 +015 -045 -006 +064 +075 +031 +031 -014 -028 -002 +067 +007 -036 -014 +027 +006 -026 -128 -18 +120 +068 -059 -043 +030  
 J012 -045 -070 +013 +001 -046 -036 +000 -065 -079 +000 -019 -048 +055 +035 -012 -000 -023 -011 -005 +002 -025 +035  
 J011 -070 -034 +001 -037 -149 -011 +057 -092 -098 +038 +025 -028 +003 -000 -003 -011 -032 -020 +036 +023 -034 -013  
 J010 -120 -072 -073 -000  
 J009 -055 -163 -097 +038 +143 +054 -060 +083 +080 -042 -000 +001 +010 +000 -046 -060 -044 -024 +002 +005  
 J008 +099 -006 -018 +116 -044 -130 -040 +056 +042 +041 -029 -073 -021 -071 -082 -105 -030 +048 -013 -027 +026 +069  
 J007 +044 +091 -003 -071 -005 +031 +016 -020 +026 +033 -023 -025 -099 -113 +078 +148 +033 -039 -054 +027  
 J006 -044 +029 -021 -146 -036 +159 -017 -050 +036 -004 -020 +050 +063 +078 +078 +066 +054 -008 -009 +059 +017  
 J005 -008 +015 +032 -042 -013 +051 +051 -013 -072 -038 -050 -017 +037 +025 +060 +077 +066 +054 -008 -009 +059 +017  
 J004 +035 -013 +069 -003 -101 -011 -054 -068 -017 -033 +010 +000 +000 +000 +000 +000 +000 +000 +000 +000 +000 +000  
 J003 -002 -019 +005 +000 +000 +000 +000 +000 +000 +000 +000 +000 +000 +000 +000 +000 +000 +000 +000 +000 +000 +000  
 J002 -023 +014 -014 +011 +047 +024 +045 +001 +021 +015 +029 +000 +000 +000 +000 +000 +000 +000 +000 +000 +000 +000  
 J001 -001 -001 +013 -002 -001 +011 -017 -074 -011 +016 -009 +023 +073 +046 -015 +014 -012 -080 +003 +072 -131 -202  
 LJ000 +019 -014 +011 +002 +005 +001 -001 -001 -001 -001 -001 -001 -001 -001 -001 -001 -001 -001 -001 -001 -001 -001 -001  
 L 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 M

L	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
LJ021	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
LJ020	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
J017	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
J018	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
J017	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
J016	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
J015	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
J014	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
J013	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
J012	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
J011	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
J010	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
J009	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
J008	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
J007	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
J006	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
J005	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
J004	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
J003	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
J002	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
J001	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
L'000	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
L	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
M	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021

VERT GRAP OF VI LAYEN ?  
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 002 11 MARCH 1964





LJ021	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
LJ020	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111
J017	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071
J018	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045
J017	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041
J016	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037
J015	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025
J014	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041
J013	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111
J012	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057
J011	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066
J010	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034
J009	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052
J008	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049
J007	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076
J006	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107
J005	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072
J004	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047
J003	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032
J002	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025
J001	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022
LJ000	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083

KINETIC ENERGY

LAYER 2

PRUG.

24 HOURS

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	1020	1019	1018	1017	1016	1015	1014	1013	1012	1011	1010	1009	1008	1007	1006	1005	1004	1003	1002	1001	1000	
LJ021	-175	-135	-109	-171	-023	-146	-145	-154	-154	-103	-131	-010	-016	-019	-015	-018	020	004	019	039	046	101
LJ020	-112	-104	-141	-140	-123	-065	-107	-107	-091	-136	-024	011	0012	-019	-031	006	011	-191	-199	-194	-031	040
J014	-020	-021	-020	-129	-121	-053	-147	-147	-146	-141	-077	-120	-053	-053	-051	-027	-061	-067	-061	-117	-055	-009
J018	-085	-067	-017	-024	-060	000	-131	-144	-054	-066	-063	-059	-059	-059	-059	-059	-059	-059	-059	-059	-059	-009
J017	-095	-123	-142	-022	-016	-066	-066	-163	-163	-163	-163	-163	-163	-163	-163	-163	-163	-163	-163	-163	-163	-076
J016	-017	-025	-012	-034	-016	-148	-044	-044	-044	-044	-044	-044	-044	-044	-044	-044	-044	-044	-044	-044	-044	-009
J015	-015	-021	-043	-005	-001	046	-054	-054	-054	-054	-054	-054	-054	-054	-054	-054	-054	-054	-054	-054	-054	-007
J014	-014	-065	-064	-063	-003	-003	-056	-056	-056	-056	-056	-056	-056	-056	-056	-056	-056	-056	-056	-056	-056	-004
J013	-128	-204	-152	-010	-162	-061	-109	-109	-109	-109	-109	-109	-109	-109	-109	-109	-109	-109	-109	-109	-109	-112
J012	-229	-196	-093	-045	-039	-039	-166	-166	-166	-166	-166	-166	-166	-166	-166	-166	-166	-166	-166	-166	-166	-081
J011	-280	-111	-027	-173	-173	-051	-000	-191	-191	-191	-191	-191	-191	-191	-191	-191	-191	-191	-191	-191	-191	-191
J010	-412	-260	-178	-183	-130	-122	-223	-223	-223	-223	-223	-223	-223	-223	-223	-223	-223	-223	-223	-223	-223	-223
J009	-470	-483	-349	-148	-148	-148	-148	-148	-148	-148	-148	-148	-148	-148	-148	-148	-148	-148	-148	-148	-148	-271
J008	-252	-360	-260	-032	-032	-032	-124	-124	-124	-124	-124	-124	-124	-124	-124	-124	-124	-124	-124	-124	-124	-174
J007	-152	-145	-179	-047	-083	-083	-083	-083	-083	-083	-083	-083	-083	-083	-083	-083	-083	-083	-083	-083	-083	-160
J006	-166	-122	-171	-234	-038	-038	-038	-038	-038	-038	-038	-038	-038	-038	-038	-038	-038	-038	-038	-038	-038	-114
J005	-085	-088	-101	-147	-060	-021	-044	-044	-044	-044	-044	-044	-044	-044	-044	-044	-044	-044	-044	-044	-044	-064
J004	-041	-179	-029	-112	-181	-074	-113	-113	-113	-113	-113	-113	-113	-113	-113	-113	-113	-113	-113	-113	-113	-050
J003	-025	-060	-054	-074	-074	-074	-074	-074	-074	-074	-074	-074	-074	-074	-074	-074	-074	-074	-074	-074	-074	-026
J002	-013	-006	-046	-032	-010	-014	-020	-022	-041	-026	-007	-054	-071	-000	-019	-044	-080	-063	-071	-045	-079	-108
J001	-017	-011	-007	-017	-039	-014	-051	-105	-046	-001	-045	-024	-039	-010	-049	-042	-012	-043	-008	-195	-219	
LJ000	-038	-055	-024	-003	-012	-016	-011	-025	-031	-018	-006	-091	-191	-191	-191	-191	-191	-191	-191	-191	-191	-092
L	1000	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

002 11 MARCH 1965

L	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
LJ021	+407	+415	+408	+393	+402	+444	+488	+417	+416	+229	+493	+131	+114	+090	+494	+094	+027	+049	+215	+140	+437	+822
LJ020	+504	+509	+499	+514	+561	+518	+594	+516	+473	+421	+246	+124	+143	+173	+400	+473	+041	+327	+147	+324	+436	+484
	+484	+484	+484	+484	+484	+484	+484	+484	+484	+484	+484	+484	+484	+484	+484	+484	+484	+484	+484	+484	+484	+484
J019	+584	+601	+615	+643	+697	+757	+774	+615	+612	+180	+302	+273	+168	+154	+274	+496	+070	+227	+132	+320	+424	+448
	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	
J018	+633	+667	+713	+739	+755	+758	+716	+634	+531	+410	+336	+228	+118	+076	+444	+438	+047	+147	+140	+340	+400	+400
	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	
J017	+684	+725	+767	+776	+768	+763	+714	+611	+498	+197	+300	+254	+165	+133	+268	+274	+044	+116	+253	+329	+391	+398
	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	
J016	+734	+758	+777	+770	+748	+734	+675	+550	+447	+178	+131	+204	+073	+019	+844	+846	+001	+177	+298	+336	+440	+440
	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	
J015	+745	+747	+745	+734	+727	+731	+604	+478	+439	+367	+313	+241	+128	+276	+964	+945	+044	+149	+287	+320	+352	+370
	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	
J014	+721	+705	+697	+694	+697	+654	+552	+457	+407	+356	+316	+281	+203	+124	+098	+110	+193	+227	+290	+324	+349	+378
	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	
J013	+677	+657	+623	+626	+634	+628	+544	+444	+418	+329	+287	+292	+237	+184	+138	+174	+203	+249	+290	+318	+353	+396
	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	
J012	+628	+584	+547	+539	+558	+566	+544	+434	+348	+278	+255	+277	+248	+210	+184	+187	+211	+234	+289	+307	+371	+434
	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	
J011	+595	+541	+504	+497	+522	+541	+534	+476	+371	+297	+277	+274	+222	+243	+204	+178	+217	+263	+306	+342	+419	+523
	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	
J010	+594	+529	+483	+496	+537	+557	+554	+505	+418	+373	+356	+344	+344	+302	+232	+227	+214	+263	+340	+416	+489	+579
	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	
J009	+624	+562	+517	+516	+555	+589	+600	+582	+533	+481	+444	+430	+412	+383	+272	+224	+231	+290	+399	+465	+544	+623
	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	
J008	+670	+618	+580	+564	+576	+614	+646	+653	+625	+576	+530	+491	+444	+408	+331	+297	+308	+393	+426	+506	+590	+670
	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	
J007	+714	+669	+636	+625	+637	+647	+698	+704	+686	+657	+618	+571	+529	+478	+427	+405	+404	+424	+483	+570	+652	+719
	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	
J006	+749	+716	+688	+684	+705	+733	+791	+754	+755	+738	+710	+674	+635	+583	+545	+523	+507	+510	+599	+645	+721	+779
	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	
J005	+776	+755	+739	+737	+753	+776	+796	+840	+817	+809	+790	+765	+724	+687	+654	+634	+617	+622	+650	+716	+777	+817
	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	
J004	+796	+782	+772	+776	+788	+808	+831	+850	+858	+856	+846	+825	+784	+754	+734	+732	+719	+723	+747	+793	+819	+849
	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	
J003	+811	+801	+796	+801	+814	+833	+856	+874	+882	+883	+877	+864	+847	+831	+815	+801	+794	+796	+806	+828	+848	+862
	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	
J002	+820	+815	+813	+814	+831	+845	+869	+884	+893	+895	+891	+881	+866	+853	+848	+845	+841	+841	+846	+853	+862	+866
	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222		

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L	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121
LJ021	-050	-046	-024	-020	-019	-012	-012	-016	-016	-013	-013	-013	-013	-013	-013	-013	-013	-013	-013	-013	-013	-013
LJ020	+052	+032	-042	-036	-036	+005	+030	+020	+014	+023	+015	+019	+017	+039	+006	+002	-043	-068	+033	+024	-036	-036
J019	+046	+026	-020	-017	+071	+006	+040	+010	+027	+040	+031	+051	+057	+017	+015	-010	-004	+006	+004	+004	+004	+034
J018	-085	-021	+037	+014	-010	+018	+010	+010	+010	+010	+010	+010	+010	+010	+010	+010	+010	+010	+010	+010	+010	+010
J017	-063	-004	+064	-018	-059	-018	-059	-018	-059	-018	-059	-018	-059	-018	-059	-018	-059	-018	-059	-018	-059	-018
J016	+029	+031	+011	-007	-078	-001	+096	-001	+096	-001	+096	-001	+096	-001	+096	-001	+096	-001	+096	-001	+096	-001
J015	+000	+025	-015	-044	+035	+063	-003	-106	-011	+025	+006	+005	-020	+026	+026	-077	-064	+016	+009	-019	-000	+025
J014	-016	+002	+028	+005	+047	+080	-080	-112	+042	+031	+001	+047	+004	-040	-040	+032	-073	-001	+000	-004	+009	-01
J013	+044	+001	-018	-031	+044	+012	-034	+025	+048	+001	-049	+049	+001	-051	-028	+064	+008	+000	+026	+070	+045	-096
J012	-013	+021	-038	-062	-071	+027	+008	+071	+063	-078	-070	+019	-025	+001	-002	-025	+007	+002	-055	-031	+007	+007
J011	-071	-026	+047	-032	-075	-014	+034	+004	-097	-082	+005	-028	-041	-011	-021	+075	+033	+043	+002	-055	-031	+007
J010	-003	-069	-113	-055	+071	+018	+030	+014	-058	+070	+070	+014	-058	+070	+070	+014	-058	+070	+070	+014	-058	+070
J009	+013	-022	-099	-078	+087	+071	+011	-011	+025	+063	+046	-023	-021	+071	+084	+020	-082	-119	-074	+027	+043	-040
J008	+021	+006	+070	-017	-017	+002	+051	+002	+051	+002	+051	+002	+051	+002	+051	+002	+051	+002	+051	+002	+051	+002
J007	+057	+012	-062	-041	-002	-071	+038	+001	-051	-039	-001	-051	-039	-001	-051	-039	-001	-051	-039	-001	-051	-039
J006	+014	+012	-086	-071	+093	+002	+010	-034	+010	-034	+010	-034	+010	-034	+010	-034	+010	-034	+010	-034	+010	-034
J005	-020	+033	+056	-067	-044	+061	-010	-047	+037	+040	+011	+014	+015	+006	+051	+005	-026	-026	-034	+005	+028	+022
J004	+011	+006	-011	-011	-048	-029	+029	+004	-022	+027	+012	-009	-004	+009	+032	+011	+006	+041	+025	-008	-017	-017
J003	+023	-002	-031	+033	-002	-060	+014	+038	-002	-024	+001	+002	-016	+016	+013	-002	+012	+009	+008	+005	+011	+029
J002	+000	-002	+001	+000	-015	+012	+025	+001	-015	+012	+004	+004	+002	+014	+005	-011	+018	+012	-007	-002	+004	+009
J001	+003	-003	-007	-001	+014	+005	+003	+004	+013	+000	+013	+021	+003	-042	+000	+027	-017	-004	+019	+040	-038	-107
LJ000	+028	-025	-042	+022	+010	-037	+002	+00	+006	+029	+001	-107	-066	+033	+013	+003	+014	+019	+014	-024	-024	-023

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J001	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	1217	1218	1219	1220	1221	1222	1223	1224	1225	1226	1227	1228	1229	1230	1231	1232	1233	1234	1235	1236	1237	1238	1239	1240	1241	1242	1243	1244	1245	1246	1247	1248	1249	1250	1251	1252	1253	1254	1255	1256	1257	1258	1259	1260	1261	1262	1263	1264	1265	1266	1267	1268	1269	1270	1271	1272	1273	1274	1275	1276	1277	1278	1279	1280	1281	1282	1283	1284	1285	1286	1287	1288	1289	1290	1291	1292	1293	1294	1295	1296	1297	1298	1299	1300	1301	1302	1303	1304	1305	1306	1307	1308	1309	1310	1311	1312	1313	1314	1315	1316	1317	1318	1319	1320	1321	1322	1323	1324	1325	1326	1327	1328	1329	1330	1331	1332	1333	1334	1335	1336	1337	1338	1339	1340	1341	1342	1343	1344	1345	1346	1347	1348	1349	1350	1351	1352	1353	1354	1355	1356	1357	1358	1359	1360	1361	1362	1363	1364	1365	1366	1367	1368	1369	1370	1371	1372	1373	1374	1375	1376	1377	1378	1379	1380	1381	1382	1383	1384	1385	1386	1387	1388	1389	1390	1391	1392	1393	1394	1395	1396	1397	1398	1399	1400	1401	1402	1403	1404	1405	1406	1407	1408	1409	1410	1411	1412	1413	1414	1415	1416	1417	1418	1419	1420	1421	1422	1423	1424	1425	1426	1427	1428	1429	1430	1431	1432	1433	1434	1435	1436	1437	1438	1439	1440	1441	1442	1443	1444	1445	1446	1447	1448	1449	1450	1451	1452	
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L	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
LJ021	-115	-158	-129	-102	-196	-072	-016	-138	-140	-054	-033	-033	-012	-13	-021	-008	-037	-124	-070	-026	-069	+002
LJ020	-041	-053	-135	-150	122	-062	-017	-074	-074	-065	-002	+001	-011	-110	-046	-019	+013	-099	-168	-057	-001	-050
J019	-015	-048	-129	-081	+039	-040	-071	-021	-042	-095	-058	+012	+016	-041	-060	-032	-014	-093	-145	-091	+057	+023
J018	-130	-092	-032	-023	-012	-007	-061	-058	-021	-082	-092	-015	-054	-095	+013	+032	-005	-151	-097	-066	-034	+045
J017	-118	-056	+037	-030	-073	+007	-006	-045	-084	-044	-037	-061	-116	-107	-025	-016	-101	-115	-024	-027	-075	-032
J016	-011	+008	+017	-010	-092	-028	-010	-122	-112	-017	-022	-035	-087	-065	-102	-153	-100	-036	+005	+001	-013	-031
J015	-010	+010	-038	-054	-015	-005	-0139	-177	-058	+001	-032	-065	-111	-050	-060	-162	-160	-081	-052	-033	-009	+025
J014	-066	-062	-034	-057	+003	-002	-173	-144	+018	+011	-037	+004	-078	-099	-025	-044	-093	-065	-032	-019	+002	-014
J013	-058	-107	-117	-059	-030	-032	-083	+060	+057	-075	-008	+041	+045	-192	-068	+012	-017	-032	+008	+059	+031	-124
J012	-138	-089	-117	-133	-059	+000	-026	+021	-079	-164	-102	+006	-010	-058	-016	-024	-049	-010	-012	-072	-076	-108
J011	-213	-105	+010	-067	-108	-023	-001	-046	-195	-154	-039	-083	-090	-060	-039	-074	-038	+006	-014	-191	-210	-088
J010	-188	-172	-178	-092	-018	-004	-015	-133	-254	-137	-130	-004	-004	-004	-004	-004	-004	-004	-004	-004	-004	-203
J009	-217	-210	-185	-142	+023	+022	-054	-100	-134	-143	-176	-131	+008	-007	-080	-119	-188	-184	-135	-033	-090	-217
J008	-211	-227	-087	-078	-208	-177	-086	-043	-109	-160	-136	-160	-154	-160	-163	-183	-140	-089	-109	-190	-212	-186
J007	-140	-223	-251	-102	-189	-257	-097	-058	-171	-194	-180	-217	-210	-267	-334	-175	-095	-190	-214	-194	-203	-201
J006	-146	-174	-285	-248	-124	-065	-109	-141	-119	-145	-232	-191	-199	-288	-323	-287	-259	-340	-373	-222	-130	-132
J005	-138	-130	-128	-230	-62	-025	-080	-080	-080	-080	-080	-080	-080	-080	-080	-080	-080	-080	-080	-080	-080	-080
J004	-074	-106	-127	-111	-082	-111	-075	-027	-061	-085	-066	-099	-137	-170	-189	-202	-255	-273	-217	-155	-125	-193
J003	-042	-081	-174	-074	-075	-21	-065	-016	-042	-074	-075	-076	-105	-105	-114	-135	-153	-178	-153	-112	-071	-065
J002	-040	-065	-075	-074	-115	-096	-059	-034	-047	-071	-082	-102	-144	-145	-126	-118	-115	-110	-108	-100	-112	-104
J001	-013	-036	-053	-053	-079	-097	-061	-033	-058	-075	-106	-135	-163	-178	-130	-079	-114	-121	-098	-083	-145	-186
LJ000	+016	-135	-058	-040	-037	-056	-054	-051	-047	-073	-096	-096	-147	-166	-047	-074	-077	-100	-105	-075	-064	-112
L	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
P	PRCG	KAT	FIELD	LAYER	1	24	HOURS	PRCG.	24	HOURS	PRCG.	24	HOURS	PRCG.	24	HOURS	PRCG.	24	HOURS	PRCG.	24	HOURS





DATE	TIME	TYPE	FROM	TO	REMARKS
1950	1	1	100	100	100
1950	2	2	100	100	100
1950	3	3	100	100	100
1950	4	4	100	100	100
1950	5	5	100	100	100
1950	6	6	100	100	100
1950	7	7	100	100	100
1950	8	8	100	100	100
1950	9	9	100	100	100
1950	10	10	100	100	100
1950	11	11	100	100	100
1950	12	12	100	100	100
1950	13	13	100	100	100
1950	14	14	100	100	100
1950	15	15	100	100	100
1950	16	16	100	100	100
1950	17	17	100	100	100
1950	18	18	100	100	100
1950	19	19	100	100	100
1950	20	20	100	100	100
1950	21	21	100	100	100
1950	22	22	100	100	100
1950	23	23	100	100	100
1950	24	24	100	100	100
1950	25	25	100	100	100
1950	26	26	100	100	100
1950	27	27	100	100	100
1950	28	28	100	100	100
1950	29	29	100	100	100
1950	30	30	100	100	100
1950	31	31	100	100	100
1950	32	32	100	100	100
1950	33	33	100	100	100
1950	34	34	100	100	100
1950	35	35	100	100	100
1950	36	36	100	100	100
1950	37	37	100	100	100
1950	38	38	100	100	100
1950	39	39	100	100	100
1950	40	40	100	100	100
1950	41	41	100	100	100
1950	42	42	100	100	100
1950	43	43	100	100	100
1950	44	44	100	100	100
1950	45	45	100	100	100
1950	46	46	100	100	100
1950	47	47	100	100	100
1950	48	48	100	100	100
1950	49	49	100	100	100
1950	50	50	100	100	100
1950	51	51	100	100	100
1950	52	52	100	100	100
1950	53	53	100	100	100
1950	54	54	100	100	100
1950	55	55	100	100	100
1950	56	56	100	100	100
1950	57	57	100	100	100
1950	58	58	100	100	100
1950	59	59	100	100	100
1950	60	60	100	100	100
1950	61	61	100	100	100
1950	62	62	100	100	100
1950	63	63	100	100	100
1950	64	64	100	100	100
1950	65	65	100	100	100
1950	66	66	100	100	100
1950	67	67	100	100	100
1950	68	68			



L 1030 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 L1021 +061 +055 +056 +069 +073 +085 +072 +094 +084 +051 +029 +019 +015 +013 +003 +002 +001 +014 +042 +074 +067 +024 +005  
 L1020 +121 +092 +087 +111 +114 +104 +044 +085 +107 +066 +028 +021 +020 +071 +006 +001 +014 +042 +074 +067 +024 +005  
 J019 +068 +071 +085 +083 +064 +042 +024 +043 +093 +078 +024 +013 +027 +033 +011 +001 +015 +043 +073 +078 +030 +003  
 J018 +033 +031 +045 +015 +006 +012 +023 +035 +072 +076 +033 +021 +045 +038 +011 +001 +015 +043 +073 +078 +030 +003  
 J017 +033 +029 +006 +000 +023 +030 +035 +080 +066 +037 +037 +051 +065 +038 +006 +003 +052 +103 +056 +014 +013 +009  
 J016 +016 +003 +004 +003 +001 +005 +070 +101 +037 +015 +030 +034 +074 +052 +013 +018 +100 +102 +026 +004 +005 +005  
 J015 +000 +005 +012 +004 +002 +028 +085 +031 +017 +017 +028 +045 +058 +048 +036 +047 +089 +045 +019 +009 +013 +011  
 J014 +014 +034 +034 +018 +014 +034 +036 +019 +013 +028 +023 +031 +033 +031 +023 +020 +032 +040 +024 +015 +011 +014  
 J013 +065 +080 +064 +051 +038 +031 +027 +082 +058 +047 +013 +013 +043 +026 +015 +024 +025 +028 +023 +013 +010 +039  
 J012 +120 +094 +085 +050 +039 +011 +011 +041 +076 +034 +002 +006 +021 +022 +014 +011 +016 +017 +015 +025 +058 +127  
 J011 +178 +087 +027 +008 +011 +004 +008 +057 +093 +047 +024 +017 +033 +034 +014 +045 +009 +016 +030 +082 +158 +191  
 J010 +286 +148 +023 +024 +039 +030 +02 +069 +145 +174 +110 +068 +071 +041 +028 +093 +009 +041 +133 +172 +166 +103  
 J009 +334 +265 +136 +084 +054 +044 +057 +100 +100 +190 +069 +180 +099 +090 +090 +000 +000 +000 +000 +000 +000 +000  
 J008 +277 +293 +186 +122 +044 +087 +106 +101 +112 +134 +178 +210 +202 +178 +141 +158 +169 +149 +155 +155 +185 +217  
 J007 +190 +255 +170 +122 +158 +144 +107 +076 +104 +128 +149 +207 +300 +359 +332 +278 +179 +111 +186 +256 +243 +191  
 J006 +117 +195 +190 +128 +134 +121 +071 +059 +094 +133 +153 +172 +239 +367 +421 +343 +255 +219 +315 +346 +235 +144  
 J005 +049 +116 +163 +125 +082 +054 +065 +052 +068 +090 +117 +124 +139 +204 +285 +329 +355 +383 +386 +291 +166 +093  
 J004 +040 +060 +090 +162 +065 +041 +046 +050 +045 +045 +057 +070 +080 +103 +148 +289 +277 +318 +275 +167 +089 +050  
 J003 +020 +031 +066 +061 +035 +048 +047 +073 +024 +023 +028 +030 +051 +063 +061 +107 +141 +198 +124 +071 +040 +024  
 J002 +008 +014 +021 +028 +036 +038 +026 +014 +012 +014 +016 +021 +028 +034 +034 +034 +034 +034 +034 +034 +034 +034 +034  
 J001 +002 +004 +007 +011 +014 +014 +009 +005 +005 +006 +007 +009 +007 +010 +018 +026 +030 +028 +023 +018 +012 +005  
 L1000 +000 +001 +002 +003 +004 +004 +003 +001 +001 +001 +004 +008 +003 +005 +008 +011 +011 +011 +011 +011 +011 +011 +011  
 L 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 M KINATIC ENERGY LAYER 2 24 HOURS 12Z 11 MARCH 1965

L	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
LJ021	-191	-105	-066	-130	-136	-101	-339	-144	-143	-178	-059	-037	-001	-13	-042	-013	-046	-130	-266	-016	-08A
LJ020	-093	-134	-143	-163	-219	-137	-021	-093	-167	-186	-309	-326	-022	-35	-066	-022	-037	-116	-052	-024	-046
J019	+015	-135	-137	-056	+116	-065	-093	-024	-001	-083	+007	+022	-03	+334	-027	-024	-043	-119	121	+044	+051
J018	-133	-081	-021	-012	+047	+111	-100	-353	-312	-138	124	-001	-019	-049	+014	+007	108	-140	-110	-098	-010
J017	-129	-013	+082	-086	-134	+054	+033	-124	-154	-165	-021	-04	-123	-28	-019	+001	110	18	-018	-037	-056
J016	+024	+044	+005	-071	-14	+020	+020	-107	-27	-125	+014	-361	101	-043	-371	108	-14	-011	+050	-021	-045
J015	-005	+14	-042	-047	+030	-213	-162	-100	-062	-002	-000	-048	-060	-045	-092	-031	-149	-17	-035	-036	-082
J014	-027	-020	-020	-030	+015	+02	-211	-140	+044	+12	-043	-004	-004	-004	-036	-036	-048	-073	-038	-024	-016
J013	-016	-122	-14	-071	+011	-11	-111	-147	-235	-204	174	-102	-011	-332	-045	+078	-04	-045	-142	-199	-295
J012	-200	-154	-126	-12	-061	-164	-032	+031	-003	-104	+031	-021	-021	-067	-016	-050	-060	-023	-045	-091	-142
J011	-320	-17	-006	-096	-11	-329	+022	-04	-194	-238	-014	-031	123	-061	-013	+004	+050	+027	-067	-284	-285
J010	-356	-133	-140	-081	-051	-04	-04	-04	-147	-235	-204	174	-102	-011	-332	-045	+078	-04	-045	-142	-199
J009	-305	-457	-325	-165	-024	-134	-123	-161	-03	-159	-250	-272	-070	-010	-04	-128	-250	-262	-53	-093	-196
J008	-309	-365	-181	-134	-222	-268	-10	-063	-136	-174	-178	-277	-327	-307	-263	-243	-14	-093	-119	-236	-308
J007	-169	-267	-167	-164	-177	-24	-097	-116	-164	-164	-164	-164	-164	-164	-164	-164	-164	-164	-164	-164	-164
J006	-114	-164	-176	-250	-007	-056	-261	-263	-126	-154	-234	-220	-184	-167	-166	-168	-331	-455	-512	-324	-206
J005	-142	-027	-120	-283	-126	-040	-04	-151	-089	-379	-138	-164	-172	-188	-276	-380	-339	-508	-516	-341	-193
J004	-064	-172	-084	-157	-1	-104	-047	-357	-038	-05	-121	-153	-194	-230	-246	-157	-298	-203	-146	-088	-071
J003	-009	-67	-103	-026	-117	-195	-083	-007	-037	-073	-052	-074	-100	-042	-099	-156	-194	-211	-154	-060	-071
J002	-016	-310	-337	-047	-075	-023	-022	-307	-345	-353	-022	-041	-037	-031	-052	-104	-076	-064	-076	-095	-050
J001	+003	-005	-019	-031	-007	+061	-015	-031	-037	-004	-010	-027	+001	-11	-039	-054	-042	-021	-316	-061	-095
LJ000	-005	-027	-336	+002	-014	-126	-303	-034	-031	-015	-034	-077	-158	-110	-027	-034	-014	-308	-024	-023	-005
L	1003	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020
L																					

12X 11 MARCH 1961

24 HOURS

LAYER 2

PRCG KAT FIELD



L	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
LJ021	+511	+502	+497	+510	+529	+537	+524	+500	+401	+219	+321	+321	+321	+321	+321	+321	+321	+321	+321	+321	+321	+307
LJ020	+511	+502	+497	+510	+529	+537	+524	+500	+401	+219	+321	+321	+321	+321	+321	+321	+321	+321	+321	+321	+321	+307
J019	+592	+611	+641	+669	+672	+648	+637	+634	+587	+584	+587	+584	+587	+584	+587	+584	+587	+584	+587	+584	+587	+584
J018	+662	+701	+741	+764	+756	+723	+683	+645	+440	+330	+247	+154	+91	+91	+91	+91	+91	+91	+91	+91	+91	+91
J017	+715	+737	+765	+794	+793	+772	+739	+672	+567	+445	+387	+254	+133	+006	+426	+901	+975	+147	+329	+614	+403	+361
J016	+748	+767	+782	+787	+757	+719	+693	+632	+529	+428	+354	+275	+137	+94	+903	+903	+903	+903	+903	+903	+903	+903
J015	+755	+762	+762	+744	+735	+652	+600	+550	+489	+421	+365	+303	+173	+025	+961	+002	+117	+249	+336	+381	+408	+427
J014	+739	+730	+725	+698	+646	+571	+506	+462	+432	+400	+364	+324	+226	+089	+053	+116	+186	+253	+315	+372	+425	+468
J013	+705	+674	+662	+640	+581	+510	+462	+423	+391	+371	+343	+323	+276	+141	+149	+167	+203	+253	+314	+376	+445	+513
J012	+649	+616	+594	+574	+537	+501	+478	+449	+422	+377	+315	+245	+242	+257	+210	+181	+147	+224	+286	+372	+471	+558
J011	+623	+576	+548	+533	+529	+524	+511	+493	+474	+443	+413	+312	+273	+290	+270	+224	+181	+165	+215	+249	+489	+589
J010	+616	+561	+521	+522	+535	+540	+535	+518	+497	+447	+343	+287	+307	+297	+262	+235	+192	+158	+199	+324	+477	+522
J009	+637	+587	+552	+537	+541	+553	+559	+547	+532	+502	+475	+367	+358	+338	+317	+284	+234	+221	+257	+337	+471	+614
J008	+640	+644	+614	+507	+576	+579	+584	+593	+598	+589	+548	+491	+451	+419	+378	+377	+337	+324	+347	+401	+511	+637
J007	+729	+701	+679	+657	+644	+636	+632	+648	+666	+665	+639	+603	+572	+540	+518	+488	+444	+431	+453	+498	+585	+683
J006	+767	+747	+736	+724	+716	+715	+716	+722	+718	+700	+694	+678	+643	+621	+593	+527	+520	+551	+592	+661	+738	
J005	+794	+783	+778	+776	+776	+776	+776	+776	+776	+776	+776	+776	+776	+776	+776	+776	+776	+776	+776	+776	+776	
J004	+815	+808	+808	+814	+819	+817	+821	+831	+837	+839	+837	+831	+823	+806	+780	+747	+720	+709	+717	+741	+779	+816
J003	+829	+826	+829	+836	+845	+851	+858	+859	+877	+878	+876	+871	+862	+847	+827	+802	+784	+780	+785	+797	+820	+842
J002	+838	+838	+842	+850	+861	+873	+882	+889	+894	+897	+895	+890	+880	+866	+851	+834	+811	+829	+831	+836	+845	+856
J001	+843	+844	+849	+857	+868	+874	+889	+894	+896	+900	+901	+899	+894	+885	+873	+860	+855	+846	+856	+857	+857	+860
LJ000	+845	+847	+852	+863	+864	+878	+887	+895	+898	+897	+894	+893	+885	+874	+860	+858	+865	+868	+868	+868	+864	+863
L	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
M	LUNER LEVEL 2 FILED LAYER 1																					

002 12 MARCH 1965

24 HOURS

PRG.

L J021  
 L J020  
 L J019  
 L J018  
 L J017  
 L J016  
 L J015  
 L J014  
 L J013  
 L J012  
 L J011  
 L J010  
 L J009  
 L J008  
 L J007  
 L J006  
 L J005  
 L J004  
 L J003  
 L J002  
 L J001  
 L J000  
 L

1001 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 +031 -044 -061 -028 -028 +035 +035 -022 -023 +015 +027 -044 -027 +057 -016 -073 -000 -005 +002  
 -005 +007 -016 -036 -017 +031 -019 -033 +038 -046 -074 +014 +057 +004 +017 +003 -037 -098 -012 -003 +038  
 +010 +022 +007 +020 +023 -034 +018 +018 +018 +022 -005 +037 +037 +008 +008 +008 +008 +008 +008 +008 +008  
 +027 -017 -033 +012 +035 +010 -001 +024 +016 -009 +008 +041 +011 -029 +021 +017 -062 +022 +106 +068 -022 -037  
 +006 -010 +007 +037 +000 +012 +000 +012 +000 +012 +000 +012 +000 +012 +000 +012 +000 +012 +000 +012 +000 +012 +000  
 +013 -019 +036 +016 -062 -048 +074 +000 +033 -048 -000 +011 -004 +016 -026 -095 -021 +032 +017 -010 -013 -018  
 +011 +008 +013 -012 +012 +012 +012 +012 +012 +012 +012 +012 +012 +012 +012 +012 +012 +012 +012 +012 +012 +012 +012  
 -003 +031 +007 -036 +070 +044 +037 -044 +041 +039 +010 +059 +044 -024 -072 +094 +043 -038 -038 -013 +014 +004  
 +003 -030 +002 +028 -045 -041 -064 +007 +005 +028 +050 +010 -013 +024 -073 +001 +044 +013 -028 -033  
 -032 +052 +011 +011 -046 -044 +028 -032 +015 +012 -084 -022 +030 +061 +067 -056 -060 +059 +071 +014 +009 -003  
 -050 -011 +011 -034 +010 +074 +028 +015 +010 +056 +071 -058 +016 +071 -087 -143 +053 +116 +007  
 -011 -046 -094 -063 +077 +020 -002 +011 +035 +017 -072 -141 +010 +011 -073 +046 +073 -104 -120 +032 +073 +001  
 -020 -069 -052 -041 -041 -041 +041 +041 +041 +041 +041 +041 +041 +041 +041 +041 +041 +041 +041 +041 +041 +041 +041  
 -020 -001 +044 -002 -052 -036 -014 -028 +048 +090 +000 -063 -081 -023 +022 -011 +009 +008 -080 -053 +029  
 +016 +032 +011 -008 +031 -034 -127 +008 +055 +020 -029 +016 +021 +042 +031 +043 +036 +008 -024 +017 -002  
 -001 +006 +021 -018 -009 +057 +035 +027 +038 +002 -110 +008 +049 -025 +064 +035 -146 -036 +081 -012 -014 +047  
 -009 -017 +020 +005 -030 +044 +016 -075 -04 +031 -051 -011 +018 -065 +002 +016 -073 -077 +002 -014 +030  
 +008 -013 -006 +010 -015 -043 -037 -049 -009 +032 +029 +003 +003 +032 +001 +029 +064 +001 -037 -018 +003 +007  
 +000 -003 +031 +002 +004 +004 +004 +004 +004 +004 +004 +004 +004 +004 +004 +004 +004 +004 +004 +004 +004 +004 +004  
 -001 -001 +000 -011 +012 +028 +017 +017 +001 -018 +003 +011 -002 +001 +015 -023 -031 +018 +028 +015 +006 +014  
 -014 -009 -002 +005 -006 -004 -011 +031 +034 -031 +009 +012 -027 +006 +009 +027 +028 -036 +025 +025 -085 -007  
 +029 -032 -024 +002 +004 -007 -001 +011 +010 -010 -018 -015 -005 -002 -032 -028 +012 +001 +003 +013 -043 -046  
 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 LAPLACIAN OF VISCOSITY LAYER 1

00Z 12 MARCH 1965

24 HOURS

L	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
LJ021	+026	+013	+016	+017	+012	+011	+014	+027	+021	+006	+012	+012	+014	+007	+011	+013	+007	+016	+030	+017	+009	
LJ020	+036	+030	+034	+032	+027	+025	+034	+033	+011	+021	+008	+12	+010	+009	+015	+009	+019	+026	+021	+003		
	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	
J019	+032	+044	+056	+054	+042	+012	+027	+024	+035	+038	+018	+009	+012	+014	+020	+024	+016	+021	+028	+025	+013	+005
	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	
J018	+036	+043	+047	+037	+023	+011	+003	+078	+036	+029	+013	+037	+017	+026	+028	+019	+001	+031	+038	+025	+007	+003
	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	
J017	+036	+035	+034	+029	+019	+013	+006	+024	+033	+016	+012	+016	+022	+022	+013	+007	+027	+043	+037	+018	+005	+005
	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	
J016	+026	+021	+004	+025	+014	+023	+034	+021	+009	+016	+027	+023	+018	+002	+017	+037	+048	+031	+008	+003	+004	
	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	
J015	+004	+011	+036	+033	+031	+043	+050	+027	+015	+009	+010	+030	+040	+029	+012	+023	+042	+044	+021	+002	+002	+003
	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	
J014	+031	+043	+039	+045	+041	+059	+044	+021	+012	+003	+010	+045	+035	+030	+018	+023	+035	+036	+024	+008	+003	+005
	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	
J013	+050	+047	+025	+012	+035	+046	+012	+034	+011	+023	+023	+023	+023	+023	+016	+025	+029	+024	+020	+016	+011	+012
	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	
J012	+051	+034	+026	+009	+026	+007	+030	+031	+038	+031	+042	+023	+014	+029	+029	+029	+029	+026	+016	+008	+017	+027
	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	
J011	+052	+023	+023	+028	+013	+075	+040	+027	+058	+041	+033	+043	+036	+027	+046	+014	+014	+015	+013	+031	+037	+028
	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	
J010	+062	+025	+004	+024	+026	+015	+032	+022	+030	+067	+071	+020	+059	+047	+010	+017	+018	+021	+027	+042	+041	+029
	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	
J009	+081	+006	+008	+008	+027	+043	+019	+013	+025	+057	+086	+082	+044	+04	+003	+020	+036	+01	+029	+039	+047	+046
	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	
J008	+102	+067	+038	+018	+06	+038	+04	+02	+004	+046	+076	+052	+056	+036	+025	+014	+024	+032	+043	+043	+031	
	2	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	
J007	+113	+079	+054	+052	+041	+076	+067	+064	+068	+067	+081	+094	+070	+055	+040	+016	+026	+042	+044	+046		
	3	222	222	222	222	222	222	222	222	222	222	222	222	222	222	222	222	222	222	222	222	
J006	+106	+140	+123	+096	+114	+179	+142	+087	+077	+091	+074	+059	+066	+059	+069	+072	+037	+039	+048	+057	+052	+053
	333	333	333	333	333	333	333	333	333	333	333	333	333	333	333	333	333	333	333	333	333	
J005	+085	+111	+120	+113	+116	+113	+086	+076	+053	+058	+079	+089	+047	+024	+050	+083	+081	+075	+078	+074	+068	+066
	2	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	
J004	+060	+076	+093	+107	+081	+067	+067	+050	+023	+006	+051	+062	+050	+045	+047	+075	+102	+101	+091	+086	+175	+062
	22222	22222	22222	22222	22222	22222	22222	22222	22222	22222	22222	22222	22222	22222	22222	22222	22222	22222	22222	22222	22222	
J003	+044	+077	+105	+116	+092	+057	+036	+026	+017	+017	+035	+056	+077	+087	+071	+058	+073	+085	+079	+075	+073	+069
	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	
J002	+035	+059	+088	+095	+097	+068	+074	+054	+030	+047	+083	+104	+105	+109	+083	+065	+073	+061	+060	+083	+100	
	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	
J001	+030	+038	+027	+028	+068	+073	+074	+073	+054	+045	+071	+092	+079	+072	+098	+114	+094	+077	+062	+062	+071	+053
LJ000	+035	+042	+062	+038	+025	+056	+072	+082	+073	+067	+076	+033	+006	+004	+025	+077	+088	+045	+056	+037	+025	+076
L	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
L																						

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24 HOURS

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VERT GRAD CF VT

L J021 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 +030 +033 +032 +030 +043 +044 +045 +046 +047 +048 +049 +050 +051 +052 +053 +054 +055 +056 +057 +058 +059 +060 +061  
 +066 +077 +094 +093 +072 +064 +056 +048 +043 +041 +034 +033 +030 +027 +024 +021 +018 +015 +012 +009 +006 +003  
 +052 +062 +075 +081 +069 +054 +046 +038 +031 +024 +017 +010 +003 +001 +001 +001 +001 +001 +001 +001 +001 +001 +001  
 J019 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 +035 +045  
 J018 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 +021 +021 +017 +065 +051 +003 +011 +037 +037 +037 +037 +037 +037 +037 +037 +037 +037 +037 +037 +037 +037 +037 +037  
 J017 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 +008 +004 +000 +005 +016 +020 +024 +028 +032 +036 +040 +044 +048 +052 +056 +060 +064 +068 +072 +076 +080 +084  
 J016 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 +001 +003 +010 +021 +029 +045 +057 +071 +085 +099 +113 +127 +141 +155 +169 +183 +197 +211 +225 +239 +253 +267  
 J015 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 +008 +022 +026 +030 +034 +038 +042 +046 +050 +054 +058 +062 +066 +070 +074 +078 +082 +086 +090 +094 +098 +102  
 J014 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 +030 +040 +044 +048 +052 +056 +060 +064 +068 +072 +076 +080 +084 +088 +092 +096 +100 +104 +108 +112 +116 +120  
 J013 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 +069 +051 +045 +040 +027 +013 +001 +001 +001 +001 +001 +001 +001 +001 +001 +001 +001 +001 +001 +001 +001 +001 +001  
 J012 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 +047 +046 +014 +001 +004 +003 +003 +003 +003 +003 +003 +003 +003 +003 +003 +003 +003 +003 +003 +003 +003 +003 +003  
 J011 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 +123 +004 +011 +000 +012 +001 +001 +001 +001 +001 +001 +001 +001 +001 +001 +001 +001 +001 +001 +001 +001 +001 +001  
 J010 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 +147 +116 +088 +030 +011 +005 +010 +019 +035 +055 +071 +087 +103 +119 +135 +151 +167 +183 +199 +215 +231 +247  
 J009 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 +141 +155 +138 +098 +065 +030 +011 +005 +010 +019 +035 +055 +071 +087 +103 +119 +135 +151 +167 +183 +199 +215 +231  
 J008 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 +103 +131 +139 +129 +119 +100 +080 +060 +040 +020 +000 +000 +000 +000 +000 +000 +000 +000 +000 +000 +000 +000  
 J007 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 +060 +081 +101 +111 +109 +119 +124 +076 +054 +057 +067 +092 +123 +137 +153 +176 +190 +204 +218 +232 +246 +260  
 J006 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 +032 +060 +075 +076 +065 +063 +055 +049 +057 +075 +077 +085 +107 +119 +161 +192 +168 +151 +153 +141 +095 +095  
 J005 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 +016 +024 +032 +040 +044 +042 +048 +046 +049 +049 +049 +049 +049 +049 +049 +049 +049 +049 +049 +049 +049 +049 +049  
 J004 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 +007 +011 +016 +021 +023 +031 +032 +037 +026 +020 +022 +024 +027 +029 +030 +030 +030 +030 +030 +030 +030 +030 +030  
 J003 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 +002 +004 +006 +009 +012 +012 +012 +012 +010 +008 +006 +006 +007 +009 +014 +022 +031 +040 +049 +058 +067 +076  
 J002 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 +001 +001 +002 +003 +034 +023 +002 +002 +001 +001 +001 +001 +001 +001 +001 +001 +001 +001 +001 +001 +001 +001 +001  
 L J000 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 KINETIC ENERGY LAYER 1 24 HOURS 00Z 12 MARCH 1965



Station	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	1217	1218	1219	1220	1221	1222	1223	1224	1225	1226	1227	1228	1229	1230	1231	1232	1233	1234	1235	1236	1237	1238	1239	1240	1241	1242	1243	1244	1245	1246	1247	1248	1249	1250	1251	1252	1253	1254	1255	1256	1257	1258	1259	1260	1261	1262	1263	1264	1265	1266	1267	1268	1269	1270	1271	1272	1273	1274	1275	1276	1277	1278	1279	1280	1281	1282	1283	1284	1285	1286	1287	1288	1289	1290	1291	1292	1293	1294	1295	1296	1297	1298	1299	1300	1301	1302	1303	1304	1305	1306	1307	1308	1309	1310	1311	1312	1313	1314	1315	1316	1317	1318	1319	1320	1321	1322	1323	1324	1325	1326	1327	1328	1329	1330	1331	1332	1333	1334	1335	1336	1337	1338	1339	1340	1341	1342	1343	1344	1345	1346	1347	1348	1349	1350	1351	1352	1353	1354	1355	1356	1357	1358	1359	1360	1361	1362	1363	1364	1365	1366	1367	1368	1369	1370	1371	1372	1373	1374	1375	1376	1377	1378	1379	1380	1381	1382	1383	1384	1385	1386	1387	1388	1389	1390	1391	1392	1393	1394	1395	1396	1397	1398	1399	1400	1401	1402	1403	1404	1405	1406	1407</
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L	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
LJ021	0000	0001	0002	0003	0004	0005	0006	0007	0008	0009	0010	0011	0012	0013	0014	0015	0016	0017	0018	0019	0020	0021
LJ020	0022	0023	0024	0025	0026	0027	0028	0029	0030	0031	0032	0033	0034	0035	0036	0037	0038	0039	0040	0041	0042	0043
J019	0044	0045	0046	0047	0048	0049	0050	0051	0052	0053	0054	0055	0056	0057	0058	0059	0060	0061	0062	0063	0064	0065
J018	0066	0067	0068	0069	0070	0071	0072	0073	0074	0075	0076	0077	0078	0079	0080	0081	0082	0083	0084	0085	0086	0087
J017	0088	0089	0090	0091	0092	0093	0094	0095	0096	0097	0098	0099	0100	0101	0102	0103	0104	0105	0106	0107	0108	0109
J016	0110	0111	0112	0113	0114	0115	0116	0117	0118	0119	0120	0121	0122	0123	0124	0125	0126	0127	0128	0129	0130	0131
J015	0132	0133	0134	0135	0136	0137	0138	0139	0140	0141	0142	0143	0144	0145	0146	0147	0148	0149	0150	0151	0152	0153
J014	0154	0155	0156	0157	0158	0159	0160	0161	0162	0163	0164	0165	0166	0167	0168	0169	0170	0171	0172	0173	0174	0175
J013	0176	0177	0178	0179	0180	0181	0182	0183	0184	0185	0186	0187	0188	0189	0190	0191	0192	0193	0194	0195	0196	0197
J012	0198	0199	0200	0201	0202	0203	0204	0205	0206	0207	0208	0209	0210	0211	0212	0213	0214	0215	0216	0217	0218	0219
J011	0220	0221	0222	0223	0224	0225	0226	0227	0228	0229	0230	0231	0232	0233	0234	0235	0236	0237	0238	0239	0240	0241
J010	0242	0243	0244	0245	0246	0247	0248	0249	0250	0251	0252	0253	0254	0255	0256	0257	0258	0259	0260	0261	0262	0263
J009	0264	0265	0266	0267	0268	0269	0270	0271	0272	0273	0274	0275	0276	0277	0278	0279	0280	0281	0282	0283	0284	0285
J008	0286	0287	0288	0289	0290	0291	0292	0293	0294	0295	0296	0297	0298	0299	0300	0301	0302	0303	0304	0305	0306	0307
J007	0308	0309	0310	0311	0312	0313	0314	0315	0316	0317	0318	0319	0320	0321	0322	0323	0324	0325	0326	0327	0328	0329
J006	0330	0331	0332	0333	0334	0335	0336	0337	0338	0339	0340	0341	0342	0343	0344	0345	0346	0347	0348	0349	0350	0351
J005	0352	0353	0354	0355	0356	0357	0358	0359	0360	0361	0362	0363	0364	0365	0366	0367	0368	0369	0370	0371	0372	0373
J004	0374	0375	0376	0377	0378	0379	0380	0381	0382	0383	0384	0385	0386	0387	0388	0389	0390	0391	0392	0393	0394	0395
J003	0396	0397	0398	0399	0400	0401	0402	0403	0404	0405	0406	0407	0408	0409	0410	0411	0412	0413	0414	0415	0416	0417
J002	0418	0419	0420	0421	0422	0423	0424	0425	0426	0427	0428	0429	0430	0431	0432	0433	0434	0435	0436	0437	0438	0439
J001	0440	0441	0442	0443	0444	0445	0446	0447	0448	0449	0450	0451	0452	0453	0454	0455	0456	0457	0458	0459	0460	0461
LJ000	0462	0463	0464	0465	0466	0467	0468	0469	0470	0471	0472	0473	0474	0475	0476	0477	0478	0479	0480	0481	0482	0483
L	0484	0485	0486	0487	0488	0489	0490	0491	0492	0493	0494	0495	0496	0497	0498	0499	0500	0501	0502	0503	0504	0505

LUNER LEVEL 2 #14-10 LAYER 2 24 HLURS 002 12 MARCH 1965

L	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
LJ021	+014	-052	-053	-098	-015	-018	-021	-031	-006	-012	-016	-016	-025	+011	-064	+012	+075	-046	-065	+024	+006	+013
LJ020	-011	-037	-015	-035	-046	-040	-029	+031	+075	+018	-036	-046	+001	+056	+004	-009	-033	-094	-093	-030	-005	+076
J019	+012	+010	-002	+055	+007	-026	-002	+037	+021	-011	-030	-009	+021	+007	+018	-009	-030	+019	+017	-036	-006	+024
J018	+028	-015	-045	+018	+050	+013	+018	+036	+002	-024	-005	+044	+022	-045	+003	+006	-027	-009	+099	+102	-013	-047
J017	-002	-004	-004	-025	-007	+041	+029	+003	-012	-018	-010	+000	-009	-013	-010	-006	-049	-009	+048	+129	-005	-047
J016	+009	-020	+074	+005	-081	-068	+063	+021	-046	-024	-015	-024	+017	+05	-018	-102	-034	+051	+038	-004	-029	-017
J015	+014	+011	-000	-023	-029	-044	+018	+043	+003	-014	-028	+031	+037	-015	-034	-003	+022	+001	+005	-067	-009	+040
J014	+023	+045	-025	-009	+077	+053	-057	-021	+036	+033	+027	+077	+037	-134	-090	+098	+069	-055	-067	-007	+021	+013
J013	+019	-039	-004	+071	+001	-038	-056	-108	-071	+042	+007	+004	+054	-016	-013	+003	+003	+077	+044	-038	-081	
J012	-051	-083	+020	+058	-071	+030	+013	-082	+017	+031	-108	-054	+025	+073	+062	-074	-060	+065	+102	+056	-011	-041
J011	-056	-016	-005	-047	+003	+084	+023	+034	+118	+059	-083	-064	+053	+014	-075	+029	+028	-121	-189	+069	+145	+022
J010	+00	-067	-114	-015	+123	+000	-013	+027	+000	+00	-064	-124	+170	+060	+48	+113	+36	-169	-179	-062	+112	-003
J009	-040	-137	-050	+041	-049	-056	+051	-061	-015	-081	-059	-114	+021	+005	-056	+022	-046	-043	-009	-044	-097	+016
J008	-028	-024	+073	-023	-026	-016	-014	-087	-029	+087	+005	-003	-113	-103	+007	+005	-036	+013	+003	-100	-077	+019
J007	+026	+079	+023	-071	+020	-020	-090	+06	+41	-044	-033	+071	+027	+010	+031	+029	+025	+050	+005	-038	+031	-003
J006	+004	+036	+013	-021	+049	+067	+033	+054	+083	+016	-126	+012	+102	+035	+072	+014	-138	-009	+128	+011	-025	+037
J005	-011	-012	+035	+010	-041	+059	+08	-101	-023	+080	-056	-063	-029	-072	+044	+007	-122	-109	+049	+007	-037	+050
J004	+010	-013	+021	+011	-082	+02	+005	-134	-052	+058	+040	+009	+002	+019	-021	+063	+00	-028	-060	-020	-013	+015
J003	+001	+003	+003	+004	+001	+001	+005	+010	+007	-025	-002	+043	+039	-011	-041	+032	+069	+007	+003	+027	-032	
J002	-006	+004	-008	-001	-022	+012	-002	+044	+008	-032	-021	-003	-012	+014	+026	-054	-050	+031	+045	+028	-013	-016
J001	+003	-003	+001	-001	-016	-008	-016	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	-001	
LJ000	+011	-011	-007	+003	+002	-004	-003	+011	+007	+004	+006	-012	-002	-008	+007	+013	-045	+006	+020	-082	-023	
L	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
L	002 12 MARCH 1965																					
L	24 HOURS																					
L	PREC.																					

002 12 MARCH 1965

24 HOURS

PROG.

LAPLACIAN OF VORTICITY LAYER 2

L  
 LJ021  
 LJ020  
 J019  
 J018  
 J017  
 J016  
 J015  
 J014  
 J013  
 J012  
 J011  
 J010  
 J009  
 J008  
 J007  
 J006  
 J005  
 J004  
 J003  
 J002  
 J001  
 LJ000  
 L

1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 +029 +055 +056 +036 +036 +036 +039 +024 +018 +014 +002 +009 +018 +014 +023 +017 +031 +034 +024 +014 +012 +009  
 +014 +038 +052 +042 +028 +024 +039 +040 +021 +016 +013 +001 +011 +019 +015 +001 +003 +010 +033 +030 +012 +005  
 +005 +004 +009 +015  
 +006 +014 +017 +016 +012 +021 +021 +021 +021 +021 +021 +021 +021 +021 +021 +021 +021 +021 +021 +021 +021 +021 +021  
 +005 +009 +015  
 +004 +004 +009 +016 +006 +010 +023 +035 +027 +021 +012 +011 +009 +011 +009 +008 +012 +017 +022 +010 +012 +014  
 +013 +004 +014 +016  
 +013 +008 +012 +015  
 +019 +028  
 +038 +047 +050 +067 +046 +031 +045 +023 +006 +022 +022 +022 +022 +022 +022 +022 +022 +022 +022 +022 +022 +022  
 +059 +059 +075  
 +089 +081 +059 +020 +047 +036 +019 +019 +019 +019 +019 +019 +019 +019 +019 +019 +019 +019 +019 +019 +019 +019 +019  
 +091 +097 +078 +077  
 +073 +085 +094 +089  
 +055 +067 +067 +043 +035 +045 +058 +065 +034 +022 +021 +027 +032 +032 +046 +042 +027 +028 +029 +031 +034 +028  
 +045 +047 +052 +036 +006 +032 +047 +047 +047 +047 +047 +047 +047 +047 +047 +047 +047 +047 +047 +047 +047 +047 +047  
 +039 +045 +056 +059 +026 +035 +030 +077 +020 +019 +031 +032 +029 +040 +038 +045 +038 +021 +026 +037 +048 +040  
 +025 +039 +052 +060 +062 +047 +036 +046 +038 +021 +030 +036 +035 +046 +044 +033 +030 +028 +041 +031 +032  
 +016 +034 +049 +065 +058 +041 +040 +040 +040 +040 +040 +040 +040 +040 +040 +040 +040 +040 +040 +040 +040 +040 +040  
 +003 +007 +015 +029 +037 +035 +024 +024 +024 +024 +024 +024 +024 +024 +024 +024 +024 +024 +024 +024 +024 +024 +024  
 +003 +007 +010 +014 +013 +005 +011 +021 +042 +025 +006 +021 +026 +020 +007 +035 +046 +048 +046 +035 +019 +046  
 +017 +05 +004  
 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 VERT UNAL CF VT  
 LAYER 2  
 PRG. 24 HOURS  
 002 12 MARCH 1965



250





LJ021	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
LJ020	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
LJ019	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
LJ018	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
LJ017	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
LJ016	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
LJ015	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
LJ014	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
LJ013	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
LJ012	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
LJ011	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
LJ010	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
LJ009	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
LJ008	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
LJ007	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
LJ006	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
LJ005	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
LJ004	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
LJ003	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
LJ002	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
LJ001	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
LJ000	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021
L	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
L	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021

LAPLACIAN CP VERTICITY LAYER 1 123 12 MARCH 1965



L	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
LJ021	+019	+003	+020	+043	+021	+013	+020	+025	+014	+045	+017	+011	+012	+017	+020	+013	+014	+009	+025	+039	+019	+010
LJ020	+014	+007	+019	+036	+029	+016	+024	+017	+016	+031	+014	+013	+027	+020	+010	+004	+010	+004	+029	+031	+015	+001
J019	+021	+000	+000	+000	+000	+000	+000	+000	+000	+000	+000	+000	+000	+000	+000	+000	+000	+000	+000	+000	+000	
J018	+024	+034	+041	+056	+054	+054	+054	+054	+054	+054	+054	+054	+054	+054	+054	+054	+054	+054	+054	+054	+054	
J017	+037	+036	+037	+044	+044	+044	+044	+044	+044	+044	+044	+044	+044	+044	+044	+044	+044	+044	+044	+044	+044	
J016	+026	+024	+022	+010	+040	+023	+008	+014	+018	+021	+021	+013	+007	+011	+028	+024	+017	+035	+042	+016	+004	
J015	+015	+017	+042	+073	+054	+054	+054	+054	+054	+054	+054	+054	+054	+054	+054	+054	+054	+054	+054	+054	+054	
J014	+006	+038	+062	+074	+073	+051	+033	+031	+028	+009	+016	+028	+035	+029	+017	+038	+046	+035	+020	+017	+011	
J013	+028	+049	+063	+040	+040	+040	+040	+040	+040	+040	+040	+040	+040	+040	+040	+040	+040	+040	+040	+040	+040	
J012	+036	+035	+039	+056	+040	+027	+011	+011	+017	+016	+016	+014	+019	+040	+038	+034	+040	+040	+040	+040	+040	
J011	+041	+024	+010	+013	+032	+043	+036	+036	+026	+029	+026	+026	+026	+026	+026	+026	+026	+026	+026	+026	+026	
J010	+048	+024	+024	+036	+026	+008	+012	+027	+026	+026	+026	+026	+026	+026	+026	+026	+026	+026	+026	+026	+026	
J009	+070	+041	+032	+023	+034	+044	+027	+017	+004	+026	+047	+064	+096	+095	+000	+030	+014	+016	+071	+030	+042	
J008	+095	+059	+045	+054	+041	+015	+033	+022	+013	+024	+042	+073	+102	+119	+140	+067	+024	+018	+027	+031	+045	
J007	+094	+083	+069	+080	+094	+017	+060	+042	+036	+046	+046	+046	+046	+046	+046	+046	+046	+046	+046	+046	+046	
J006	+065	+085	+077	+062	+091	+119	+084	+063	+097	+093	+053	+032	+051	+036	+049	+077	+091	+071	+065	+069	+076	
J005	+060	+005	+061	+063	+069	+065	+069	+074	+089	+071	+053	+038	+051	+040	+062	+059	+089	+084	+087	+095	+087	
J004	+074	+068	+054	+067	+047	+016	+048	+083	+056	+023	+042	+059	+066	+076	+057	+051	+072	+090	+103	+104	+092	
J003	+063	+078	+074	+069	+059	+020	+065	+068	+044	+030	+045	+056	+034	+047	+055	+054	+065	+096	+109	+103	+102	
J002	+041	+062	+080	+079	+093	+074	+068	+053	+028	+042	+056	+034	+014	+033	+069	+074	+102	+134	+115	+095	+096	
J001	+026	+034	+046	+054	+087	+117	+093	+036	+023	+038	+062	+075	+050	+057	+062	+083	+125	+126	+111	+091	+074	
LJ000	+004	+012	+025	+026	+044	+072	+055	+043	+040	+043	+040	+031	+049	+028	+046	+077	+084	+061	+068	+080	+053	
L	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
P	VINT GRAD LF VT																					

122 12 MARCH 1965

24 HOURS

PRCS.

LAYER 1

L 1009 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 LJO21 +042 +028 +045 +032 +076 +028 +027 +031 +034 +018 +004 +001 +011 +012 +003 +009 +030 +081 +099 +035 +011  
 LJO20 +049 +036 +031 +066 +077 +056 +049 +057 +048 +061 +052 +009 +002 +012 +011 +004 +018 +060 +096 +048 +006 +007  
 J019 +037 +32 +36 +079 +116 +086 +054 +054 +063 +075 +094 +042 +075 +001 +004 +009 +024 +077 +008 +013 +009 +004  
 J018 +028 +027 +032 +034 +041 +045 +035 +031 +044 +060 +075 +039 +022 +038 +008 +002 +031 +080 +059 +008 +002 +004  
 J017 +016 +013 +009 +002 +001 +006 +013 +019 +028 +044 +003 +041 +030 +031 +017 +008 +060 +079 +044 +008 +001 +003  
 J016 +006 +004 +003 +004 +008 +012 +020 +030 +040 +050 +042 +027 +032 +030 +015 +024 +097 +008 +024 +007 +000 +005  
 J015 +003 +000 +009 +037 +041 +046 +047 +042 +043 +031 +026 +039 +040 +012 +055 +074 +036 +018 +014 +007 +013  
 J014 +001 +007 +045 +091 +097 +073 +003 +042 +029 +015 +011 +027 +062 +048 +018 +040 +028 +013 +020 +033 +033 +030  
 J013 +026 +042 +006 +084 +006 +025 +013 +041 +075 +001 +001 +001 +047 +058 +017 +011 +010 +018 +040 +075 +076  
 J012 +023 +063 +074 +045 +000 +000 +001 +006 +011 +004 +005 +004 +017 +035 +014 +005 +001 +006 +009 +028 +071 +116  
 J011 +058 +027 +046 +027 +019 +033 +002 +007 +019 +030 +023 +006 +008 +026 +016 +006 +003 +001 +008 +008 +059 +138  
 J010 +084 +038 +021 +017 +013 +005 +004 +006 +011 +036 +040 +042 +028 +019 +046 +073 +015 +023 +044 +069 +134 +210  
 J009 +120 +063 +032 +035 +038 +025 +018 +013 +011 +030 +079 +116 +102 +088 +100 +094 +087 +109 +124 +141 +196 +232  
 J008 +138 +115 +091 +091 +046 +081 +064 +049 +055 +056 +098 +153 +182 +178 +071 +190 +199 +197 +192 +189 +197 +220  
 J007 +108 +122 +115 +109 +117 +113 +100 +124 +114 +045 +096 +134 +150 +180 +198 +201 +199 +203 +197 +184 +205 +206  
 J006 +064 +077 +078 +077 +086 +102 +108 +130 +127 +108 +093 +092 +102 +102 +102 +102 +102 +102 +102 +102 +102 +102 +102  
 J005 +038 +044 +044 +047 +048 +044 +055 +067 +074 +073 +063 +058 +071 +064 +100 +115 +117 +112 +118 +123 +119 +096  
 J004 +022 +028 +029 +032 +030 +026 +033 +037 +040 +043 +039 +035 +064 +058 +064 +070 +084 +093 +091 +089 +088 +058  
 J003 +012 +017 +020 +021 +021 +024 +031 +027 +023 +022 +018 +018 +024 +028 +030 +037 +038 +038 +038 +038 +038 +038  
 J002 +005 +008 +011 +011 +013 +015 +020 +013 +010 +009 +006 +005 +008 +008 +009 +016 +021 +019 +018 +015 +009 +007  
 J001 +002 +003 +005 +005 +006 +005 +008 +005 +003 +002 +001 +001 +001 +001 +002 +004 +004 +004 +004 +004 +004 +004  
 LJO00 +001 +001 +002 +002 +002 +003 +003 +002 +001 +000 +001 +002 +003 +003 +001 +001 +001 +001 +001 +001 +001 +001  
 L 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 KINETIC ENERGY LAYER I 24 HOURS 122 12 MARCH 1965

L	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
LJ021	-107	-132	+044	-080	-137	-014	-044	-066	-018	-135	-047	-026	+003	+031	-046	-047	+031	-061	-221	-185	+012
LJ020	-043	-112	-045	-166	-235	-109	-059	-068	-053	-060	-139	-137	-023	+070	-010	-037	-032	-053	-109	-031	-032
J019	-033	-067	-112	-094	-127	-105	-094	-055	-127	-110	-135	-106	-061	-053	+007	-030	-077	-088	-009	+022	-025
J018	-046	-055	-104	-035	+034	-102	-080	-027	-055	-053	-043	-075	-075	-032	-013	-008	-037	-160	-074	+005	+001
J017	-029	-031	-024	-053	-073	-002	-010	-045	-036	-035	-051	-059	-014	-011	-049	-090	-031	-091	-002	+026	-044
J016	-034	-062	-070	-003	-079	-050	-005	-024	-074	-043	-049	-051	+002	-011	-005	-182	-187	-042	-046	-023	-004
J015	-052	-054	-047	-042	-035	-054	-047	-054	-011	-056	-104	-041	-067	-063	-051	-043	-056	-031	-004	-019	-014
J014	-012	-016	-035	-104	-044	-070	-099	-118	-034	-035	-061	-023	-010	-182	-091	+017	-014	-054	-036	-057	-023
J013	-034	-039	-144	-024	-137	-042	-014	-042	-014	-042	-042	-042	-042	-042	-042	-042	-042	-042	-042	-042	-025
J012	-051	-051	-051	-051	-051	-051	-051	-051	-051	-051	-051	-051	-051	-051	-051	-051	-051	-051	-051	-051	-161
J011	-154	-040	+042	+002	-024	+035	-008	-024	+012	-012	-012	-104	-002	-061	-040	+034	-010	-105	-056	+023	-150
J010	-210	-006	+004	-042	-047	-030	-039	-021	+021	+021	+021	-167	-071	-002	-002	-04	+004	-082	-04	-103	-204
J009	-247	-117	-004	-004	-054	-023	-075	-034	-005	-033	087	-207	-272	-197	-002	-181	-197	-121	-148	-210	-214
J008	-224	-249	-194	-114	-104	-134	-114	-104	-134	-114	-104	-134	-114	-104	-134	-114	-104	-134	-114	-104	-215
J007	-148	-104	-141	-142	-141	-124	-101	-021	-021	-021	-021	-021	-021	-021	-021	-021	-021	-021	-021	-021	-312
J006	-121	-155	-122	-131	-134	-149	-142	-134	-149	-142	-134	-149	-142	-134	-149	-142	-134	-149	-142	-134	-278
J005	-047	-124	-114	-113	-113	-098	-044	-131	-170	-142	-051	-117	-04	-161	-134	-231	-230	-202	-229	-227	-150
J004	-076	-114	-117	-081	-054	-044	-134	-124	-044	-044	-071	-121	-14	-044	-044	-044	-044	-044	-044	-044	-124
J003	-041	-102	-33	-047	-047	-113	-118	-044	-040	-087	-034	-057	-111	-069	-046	-117	-143	-113	-139	-131	-109
J002	-046	-173	-091	-063	-04	-122	-046	-033	-034	-072	-071	-006	+004	-036	-070	-08	-112	-132	-125	-082	-077
J001	-041	-052	-057	-054	-040	-054	-101	-041	-044	-032	-055	-056	-042	-100	-087	-051	-119	-161	-089	-074	-162
LJ000	-030	-047	-049	-047	-047	-047	-047	-047	-047	-047	-047	-047	-047	-047	-047	-047	-047	-047	-047	-047	-077
L	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020

122 12 M/NOV 1965

24 HOURS

LAYER 1

WFO MAP FILE





L  
 LJ021  
 LJ020  
 J019  
 J018  
 J017  
 J016  
 J015  
 J014  
 J013  
 J012  
 J011  
 J010  
 J009  
 J008  
 J007  
 J006  
 J005  
 J004  
 J003  
 J002  
 J001  
 LJ000  
 L  
 M

1003 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021  
 -058 -055 -054 -046 -041 -037 -035 -059 -049 -046 -003 -001 -022 -005 -011 -007 -013 -048 -096 -047 -062 +002  
 +024 +000 -035 -006 -006 -107 -126 +005 +011 +054 +010 -044 -040 +031 +005 -041 -026 +033 +042 +043 -028 -044  
 +024 -004  
 -012 -006  
 +011 +024 +024 -029 -000 +033 +008 -021 +022 +028 -002 -002 -002 -002 -002 -002 -002 -002 -002 -002 -002  
 -033 -011 +016 +031 -021 -021 +022 +028 -002 -002 -002 -002 -002 -002 -002 -002 -002 -002 -002 -002 -002  
 -038 -055 +003 +053 +015 -007 +001 +025 +045 -015 -076 -053 +008 +020 -052 -000 +034 +028 -002 -014 -009  
 +022 +016 +052 -017 -000 +055 -006 -052 -008 +038 -000 -001 +021 -005 -035 +091 +067 +019 +022 -017 +031 +042  
 +076 +056 -015 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000  
 +031 +017 -047 -012 -035 -005 +039 +004 -044 -011 -000 +003 +043 +014 -028 -029 -006 -026 -011 -028 -018 -071  
 -052 -031 +046 +027 +012 +045 +000 +019 +094 +035 -103 -090 +051 +013 -145 +076 +165 -058 -005 +103 -107 -171  
 -091 -070 +065 -013 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000  
 -057 -111 -039 -013 -046 -035 +002 -027 -000 +018 +027 -036 -060 +029 +000 -078 -156 -032 -025 -060 +031 +094  
 +035 -095 -080 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000  
 +065 -004 -033 +056 +000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000  
 +001 +037 +053 -001 +026 +067 +011 +069 +061 -024 -021 -000 +018 +001 -001 -003 -037 +051 -043 +011 +079  
 -005 -005 -111 -025 -10 +056 +000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000 -000  
 +041 -010 -097 -001 +030 -074 -054 -015 -029 -007 +045 +032 +000 -000 -000 -000 -000 -000 -000 -000  
 +029 +001 -063 +059 -026 -119 -003 +082 -024 -053 -015 +031 -001 -001 -001 -001 -001 -001 -001 -001  
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 +004 -008 -004 -004 -004 +022 -002 -002 -002 -002 -002 -002 -002 -002 -002 -002 -002 -002 -002 -002 -002  
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 L  
 M

LAPLACIAN OF VERTICITY LAYER 2

PRG.

24 HOUR

12Z 12 MARCH 1965









TABLE 1

AIRORAFT TURBULENCE CRITERIA

<u>CATEGORY</u>	<u>DEFINITION</u>
<b>LIGHT</b>	A turbulent condition during which occupants may be required to use seat belts, but objects in the aircraft remain at rest.
<b>MODERATE</b>	A turbulent condition in which occupants require seat belts and occasionally are thrown against the belt. Unsecured objects in aircraft move about.
<b>SEVERE</b>	A turbulent condition in which the aircraft momentarily may be out of control. Occupants are thrown violently against the belt and back into the seat. Objects not secured in the aircraft are tossed about.
<b>EXTREME</b>	A rarely encountered turbulent condition in which the aircraft is violently tossed about, and is practically impossible to control. May cause structural damage to the aircraft.

FIELD	DATE	TIME	LENGTH	TOTAL "	%	1-15-M	M	N	Y
				OF OTHER	OF OTHER	OF OTHER	OF OTHER	OF OTHER	OF OTHER
LAPLACIAN OF VORTICITY	10 MAR 65	0004	1	19	79	7	6	2	1
VERTICAL GRADIENT OF THERMAL WIND	"	"	"	"	63	8	6	2	0
KINETIC ENERGY	"	"	"	"	26	11	3	6	0
KAT FIELD	"	"	"	"	22	11	2	6	1
LAPLACIAN OF VORTICITY	10 MAR 65	"	11	22	67	22	16	8	0
VERTICAL GRADIENT OF THERMAL WIND	"	"	"	"	90	22	16	12	0
KINETIC ENERGY	"	"	"	"	86	22	12	13	0
KAT FIELD	"	"	"	"	76	22	10	12	0
LAPLACIAN OF VORTICITY	10 MAR 65	1224	1	15	71	6	5	5	0
VERTICAL GRADIENT OF THERMAL WIND	"	"	"	"	57	6	3	2	0
KINETIC ENERGY	"	"	"	"	93	6	5	5	0
KAT FIELD	"	"	"	"	71	6	5	4	0
LAPLACIAN OF VORTICITY	10 MAR 65	"	11	21	71	15	9	6	0
VERTICAL GRADIENT OF THERMAL WIND	"	"	"	"	90	15	13	6	0
KINETIC ENERGY	"	"	"	"	90	15	13	6	0
KAT FIELD	"	"	"	"	90	15	13	6	0

TABLE 2

FIELDS	DATE	TIME	LAYER	TOTAL # OF OCCR	%	L to M		M		M to S		S	
						OCCR	CORR	OCCR	CORR	OCCR	CORR	OCCR	CORR
LAPLACIAN OF VORTICITY	11 MAR 65	00Z	I	40	66	21	10	13	11	5	5	1	1
VERTICAL GRADIENT OF THERMAL WIND	"	"	"	"	100	21	21	13	13	5	5	1	1
KINETIC ENERGY	"	"	"	"	67	21	15	13	8	5	4	1	0
KAT FIELD	"	"	"	"	63	21	9	13	9	5	5	1	1
LAPLACIAN OF VORTICITY	11 MAR 65	00Z	II	51	71	31	21	16	11	4	4	0	0
VERTICAL GRADIENT OF THERMAL WIND	"	"	"	"	98	31	30	16	16	4	4	0	0
KINETIC ENERGY	"	"	"	"	88	31	29	16	12	4	4	0	0
KAT FIELD	"	"	"	"	82	31	25	16	13	4	4	0	0
LAPLACIAN OF VORTICITY	11 MAR 65	12Z	I	22	77	14	9	6	6	1	1	1	1
VERTICAL GRADIENT OF THERMAL WIND	"	"	"	"	86	14	11	6	6	1	1	1	1
KINETIC ENERGY	"	"	"	"	64	14	10	6	4	1	0	1	0
KAT FIELD	"	"	"	"	50	14	8	6	2	1	0	1	0
LAPLACIAN OF VORTICITY	11 MAR 65	12Z	II	5	60	3	3	2	0	0	0	0	0
VERTICAL GRADIENT OF THERMAL WIND	"	"	"	"	80	3	2	2	0	0	0	0	0
KINETIC ENERGY	"	"	"	"	60	3	2	2	1		0	0	0
KAT FIELD	"	"	"	"	40	3	1	2	1	0			

TABLE 3

FIELDS	DATE	TIME	LAYER	TOTAL # OF OCCR	%	L to M		M		M to S		S	
						OCCR	CORR	OCCR	CORR	OCCR	CORR	OCCR	CORR
LAPLACIAN OF VORTICITY	12 MAR 65	00Z	I	27	52	11	7	11	6	2	1	3	1
VERTICAL GRADIENT OF THERMAL WIND	"	"	"	"	92	11	16	11	10	2	2	3	3
KINETIC ENERGY	"	"	"	"	70	11	6	11	10	2	1	3	1
KAT FIELD	"	"	"	"	59	11	7	11	7	2	1	3	1
LAPLACIAN OF VORTICITY	12 MAR 65	00Z	II	19	53	4	2	9	5	5	2	1	1
VERTICAL GRADIENT OF THERMAL WIND	"	"	"	"	89	4	3	9	8	5	5	1	1
KINETIC ENERGY	"	"	"	"	63	4	1	9	5	5	5	1	1
KAT FIELD	"	"	"	"	48	4	2	9	5	5	2	1	1
LAPLACIAN OF VORTICITY	12 MAR 65	12Z	I	26	77	15	10	11	8	0	0	0	0
VERTICAL GRADIENT OF THERMAL WIND	"	"	"	"	100	15	15	11	11	0	0	0	0
KINETIC ENERGY	"	"	"	"	88	15	13	11	10	0	0	0	0
KAT FIELD	"	"	"	"	92	15	14	11	10	0	0	0	0
LAPLACIAN OF VORTICITY	12 MAR 65	12Z	II	16	81	12	9	2	2	2	2	0	0
VERTICAL GRADIENT OF THERMAL WIND	"	"	"	"	94	12	11	2	2	2	2	0	0
KINETIC ENERGY	"	"	"	"	94	12	11	2	2	2	2	0	0
KAT FIELD	"	"	"	"	87	12	11	2	1	2	2	0	0

TABLE 4

	All Categories	LIGHT TO MODERATE	MODERATE	MODERATE TO SEVERE	SEVERE
TOTAL NUMBER OF KAT OCCURRENCES	302	165	103	28	6
(10 MARCH 1965 TO 12 MARCH 1965)					
PERCENT CORRELATION ( BY FIELD AND CATEGORY )					
LAPLACIAN OF VORTICITY		65	71	71	67
VERTICAL GRADIENT OF THERMAL WIND		90	89	93	100
KINETIC ENERGY		70	76	78	33
KAT FIELD		72	70	60	50
PERCENT CORRELATION ( BY FIELD )					
LAPLACIAN OF VORTICITY	68				
VERTIC. GRADIENT OF THERMAL WIND	90				
KINETIC ENERGY	76				
KAT FIELD	70				

TABLE 5

UNCLASSIFIED

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Thesis			
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13. ABSTRACT			
<p>There is much disagreement as to (a) what causes clear air turbulence (turbulence which is not in or near convective clouds and is above 15,000 feet in altitude) and (b) which meteorological parameters can be used to detect and forecast its occurrence. The approach to this problem has been to relate not one parameter to clear air turbulence but various parameters. By summing these parameters areas can be defined where there is a high probability of encountering clear air turbulence. Each parameter has been based on a statistical study which found a relationship with clear air turbulence. The parameters used were horizontal and vertical shear, curvature, kinetic energy and their derivatives. The numerical forecasting program proposed here can be extended to the stratosphere when more reliable height and temperature fields are available. This program will have much more significance when intermediate forecast height fields, temperature fields and a grid of much smaller mesh length are available.</p>			

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1 JAN 64

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Security Classification

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